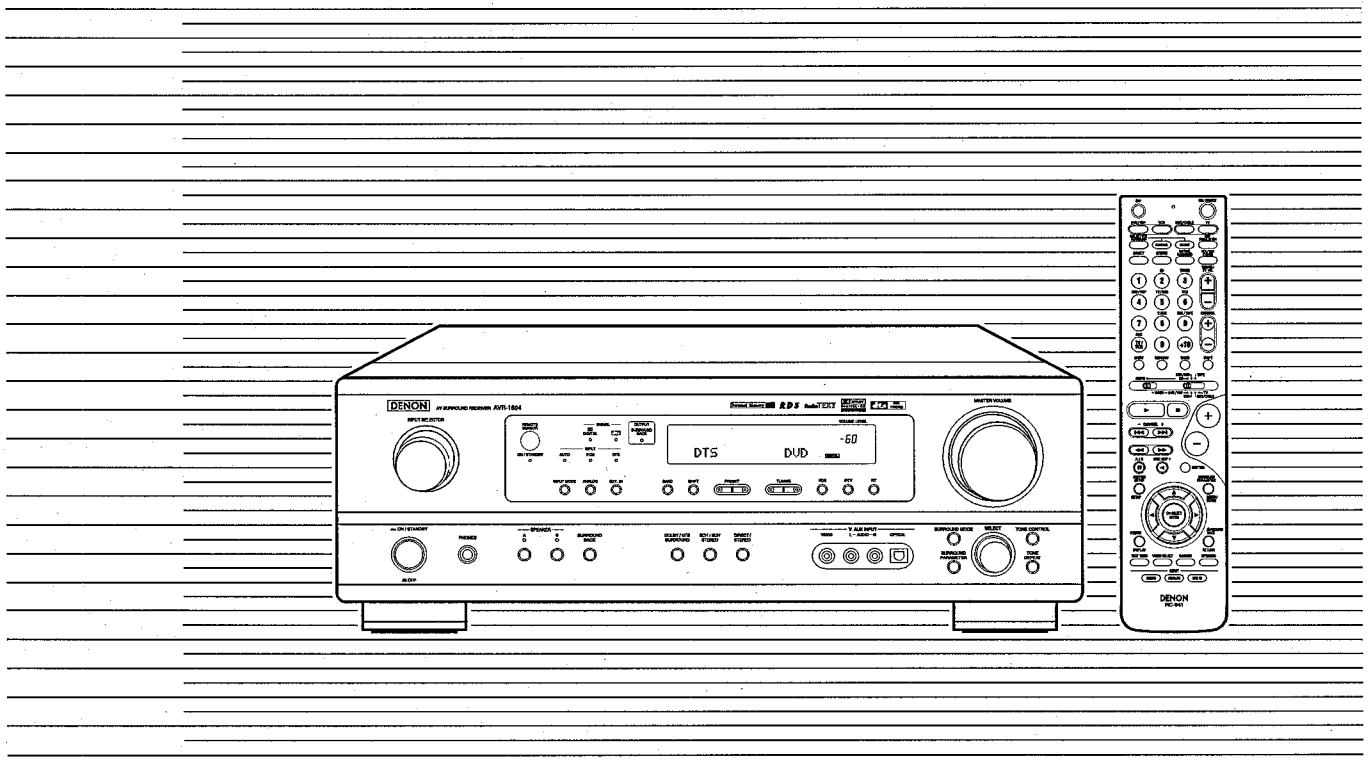
DENON

AV SURROUND RECEIVER

AVR-1604

OPERATING INSTRUCTIONS



FOR ENGLISH READERS PAGE 3 ~ PAGE 37

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

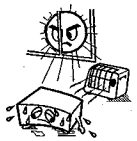
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

- **DECLARATION OF CONFORMITY**
  We declare under our sole responsibility that this product, to which this declaration relates, is in conformity with the following standards:
  EN60065, EN55013, EN55020, EN61000-3-2 and EN61000-3-3.
  Following the provisions of 73/23/EEC, 89/336/EEC and 93/68/EEC Directive.
- **ÜBEREINSTIMMUNGSERKLÄRUNG**
  Wir erklären unter unserer Verantwortung, daß dieses Produkt, auf das sich diese Erklärung bezieht, den folgenden Standards entspricht:
  EN60065, EN55013, EN55020, EN61000-3-2 und EN61000-3-3.
  Entspricht den Verordnungen der Direktive 73/23/EEC, 89/336/EEC und 93/68/EEC.
- **DECLARATION DE CONFORMITE**
  Nous déclarons sous notre seule responsabilité que l'appareil, auquel se réfère cette déclaration, est conforme aux standards suivants:
  EN60065, EN55013, EN55020, EN61000-3-2 et EN61000-3-3.
  D'après les dispositions de la Directive 73/23/EEC, 89/336/EEC et 93/68/EEC.
- **DICHIARAZIONE DI CONFORMITÀ**
  Dichiariamo con piena responsabilità che questo prodotto, al quale la nostra dichiarazione si riferisce, è conforme alle seguenti normative:
  EN60065, EN55013, EN55020, EN61000-3-2 e EN61000-3-3.
  In conformità con le condizioni delle direttive 73/23/EEC, 89/336/EEC e 93/68/EEC.
  QUESTO PRODOTTO E' CONFORME
  AL D.M. 28/08/95 N. 548

- **DECLARACIÓN DE CONFORMIDAD**
  Declaramos bajo nuestra exclusiva responsabilidad que este producto al que hace referencia esta declaración, está conforme con los siguientes estándares:
  EN60065, EN55013, EN55020, EN61000-3-2 y EN61000-3-3.
  Siguiendo las provisiones de las Directivas 73/23/EEC, 89/336/EEC y 93/68/EEC.
- **EENVORMIGHEIDSVERKLARING**
  Wij verklaren uitsluitend op onze verantwoordelijkheid dat dit produkt, waarop deze verklaring betrekking heeft, in overeenstemming is met de volgende normen:
  EN60065, EN55013, EN55020, EN61000-3-2 en EN61000-3-3.
  Volgens de bepalingen van de Richtlijnen 73/23/EEC, 89/336/EEC en 93/68/EEC.
- **ÖVERENSSTÄMMELSESINTYG**
  Härmed intygas helt på eget ansvar att denna produkt, vilken detta intyg avser, uppfyller följande standarder:
  EN60065, EN55013, EN55020, EN61000-3-2 och EN61000-3-3.
  Enligt stadgarna i direktiv 73/23/EEC, 89/336/EEC och 93/68/EEC.

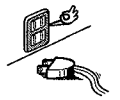
NOTE ON USE / HINWEISE ZUM GEBRAUCH / OBSERVATIONS RELATIVES A L'UTILISATION / NOTE SULL'USO NOTAS SOBRE EL USO / ALVORENS TE GEBRUIKEN / OBSERVERA



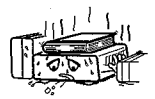
- Avoid high temperatures.
  Allow for sufficient heat dispersion when installed on a rack.
- Vermeiden Sie hohe Temperaturen.
  Beachten Sie, daß eine ausreichend Luftzirkulation gewährleistet wird, wenn das Gerät auf ein Regal gestellt wird.
- Eviter des températures élevées
  Tenir compte d'une dispersion de chaleur suffisante lors de l'installation sur une étagère.
- Evitate di esporre l'unità a temperature alte.
  Assicuratevi che ci sia un'adeguata dispersione del calore quando installate l'unità in un mobile per componenti audio.
- Evite altas temperaturas
  Permite la suficiente dispersión del calor cuando está instalado en la consola.
- Vermijd hoge temperaturen.
  Zorg voor een degelijk hitteafvoer indien het apparaat op een rek wordt geplaatst.
- Undvik höga temperaturer.
  Se till att det finns möjlighet till god värmeavledning vid montering i ett rack.

- Handle the power cord carefully.
  Hold the plug when unplugging the cord.
- Gehen Sie vorsichtig mit dem Netzkabel um.
  Halten Sie das Kabel am Stecker, wenn Sie den Stecker herausziehen.
- Manipuler le cordon d'alimentation avec précaution.
  Tenir la prise lors du débranchement du cordon.
- Manneggiate il filo di alimentazione con cura.
  Agite per la spina quando scollegate il cavo dalla presa.
- Maneje el cordón de energía con cuidado.
  Sostenga el enchufe cuando desconecte el cordón de energía.
- Hanteer het netsnoer voorzichtig.
  Houd het snoer bij de stekker vast wanneer deze moet worden aan- of losgekoppeld.
- Hantera nätkabeln varsamt.
  Håll i kabeln när den kopplas från el-uttaget.

- Keep the set free from moisture, water, and dust.
- Halten Sie das Gerät von Feuchtigkeit, Wasser und Staub fern.
- Protéger l'appareil contre l'humidité, l'eau et lapoussière.
- Tenete l'unità lontana dall'umidità, dall'acqua e dalla polvere.
- Mantenga el equipo libre de humedad, agua y polvo.
- Laat geen vochtigheid, water of stof in het apparaat binnendringen.
- Utsätt inte apparaten för fukt, vatten och damm.



- Unplug the power cord when not using the set for long periods of time.
- Wenn das Gerät eine längere Zeit nicht verwendet werden soll, trennen Sie das Netzkabel vom Netzstecker.
- Débrancher le cordon d'alimentation lorsque l'appareil n'est pas utilisé pendant de longues périodes.
- Disinnestate il filo di alimentazione quando avete l'intenzione di non usare il filo di alimentazione per un lungo periodo di tempo.
- Desconecte el cordón de energía cuando no utilice el equipo por mucho tiempo.
- Neem altijd het netsnoer uit het stopkontakt wanneer het apparaat gedurende een lange periode niet wordt gebruikt.
- Koppla ur nätkabeln om apparaten inte kommer att användas i lång tid.



* (For sets with ventilation holes)

- Do not obstruct the ventilation holes.
- Die Belüftungsöffnungen dürfen nicht verdeckt werden.
- Ne pas obstruer les trous d'aération.
- Non coprite i fori di ventilazione.
- No obstruya los orificios de ventilación.
- De ventilatieopeningen mogen niet worden beblokkeerd.
- Täpp inte till ventilationsöppningarna.

- Do not let foreign objects in the set.
- Keine fremden Gegenstände in das Gerät kommen lassen.
- Ne pas laisser des objets étrangers dans l'appareil.
- E' importante che nessun oggetto è inserito all'interno dell'unità.
- No deje objetos extraños dentro del equipo.
- Laat geen vreemde voorwerpen in dit apparaat vallen.
- Se till att främmande föremål inte tränger in i apparaten.

- Do not let insecticides, benzene, and thinner come in contact with the set.
- Lassen Sie das Gerät nicht mit Insektiziden, Benzin oder Verdünnungsmitteln in Berührung kommen.
- Ne pas mettre en contact des insecticides, du benzène et un diluant avec l'appareil.
- Assicuratevvi che l'unità non venga in contatto con insetticidi, benzolo o solventi.
- No permita el contacto de insecticidas, gasolina y diluyentes con el equipo.
- Laat geen insektenverdelgende middelen, benzine of verfverdunner met dit apparaat in kontakt komen.
- Se till att inte insektsmedel på spraybruk, bensen och thinner kommer i kontakt med apparatens hölje.

- Never disassemble or modify the set in any way.
- Versuchen Sie niemals das Gerät auseinander zu nehmen oder auf jegliche Art zu verändern.
- Ne jamais démonter ou modifier l'appareil d'une manière ou d'une autre.
- Non smontate mai, nè modificate l'unità in nessun modo.
- Nunca desarme o modifique el equipo de ninguna manera.
- Nooit dit apparaat demonteren of op andere wijze modifiëren.
- Ta inte isär apparaten och försök inte bygga om den.

CAUTION
- The ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, table-cloths, curtains, etc.
- No naked flame sources, such as lighted candles, should be placed on the apparatus.
- Please be care the environmental aspects of battery disposal.
- The apparatus shall not be exposed to dripping or splashing for use.
- No objects filled with liquids, such as vases, shall be placed on the apparatus.

■ **We greatly appreciate your purchase of the AVR-1604.**
■ **To be sure you take maximum advantage of all the features the AVR-1604 has to offer, read these instructions carefully and use the set properly. Be sure to keep this manual for future reference, should any questions or problems arise.**

"SERIAL NO. _____
PLEASE RECORD UNIT SERIAL NUMBER ATTACHED TO THE REAR OF THE CABINET FOR FUTURE REFERENCE"

■ INTRODUCTION

Thank you for choosing the DENON A/V Surround receiver. This remarkable component has been engineered to provide superb surround sound listening with home theater sources such as DVD, as well as providing outstanding high fidelity reproduction of your favorite music sources.
As this product is provided with an immense array of features, we recommend that before you begin hookup and operation that you review the contents of this manual before proceeding.

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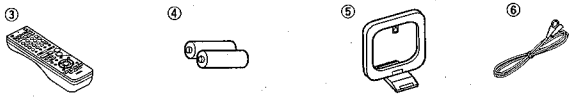
■ ACCESSORIES

Check that the following parts are included in addition to the main unit:

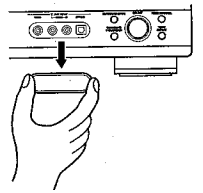
① Operating instructions 1
② Service station list 1
③ Remote control unit (RC-941) 1
④ R6P/AA batteries 2
⑤ AM loop antenna 1
⑥ FM indoor antenna 1



1 BEFORE USING

Pay attention to the following before using this unit:

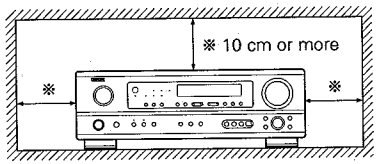
- **Moving the set**
  To prevent short circuits or damaged wires in the connection cords, always unplug the power supply cord and disconnect the connection cords between all other audio components when moving the set.
- **Before turning the power operation switch on**
  Check once again that all connections are proper and that there are not problems with the connection cords. Always set the power operation switch to the standby position before connecting and disconnecting connection cords.
- **Store this instructions in a safe place**
  After reading, store this instructions along with the warranty in a safe place.
- **Note that the illustrations in this instructions may differ from the actual set for explanation purposes.**
- **V. AUX terminal**
  The AVR-1604's front panel is equipped with a V. AUX terminal. Remove the cap covering the terminal when you want to use it.

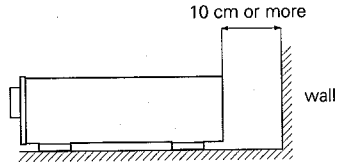


2 CAUTIONS ON INSTALLATION

Noise or disturbance of the picture may be generated if this unit or any other electronic equipment using microprocessors is used near a tuner or TV.
If this happens, take the following steps:
- Install this unit as far as possible from the tuner or TV.
- Set the antenna wires from the tuner or TV away from this unit's power supply cord and input/output connection cords.
- Noise or disturbance tends to occur particularly when using indoor antennas or 300 Ω/ohms feeder wires. **We recommend using outdoor antennas and 75 Ω/ohms coaxial cables.**

For heat dispersal, leave at least 10 cm of space between the top, back and sides of this unit and the wall or other components.





3 CAUTIONS ON HANDLING

- **Switching the input function when input jacks are not connected**
  A clicking noise may be produced if the input function is switched when nothing is connected to the input jacks. If this happens, either turn down the MASTER VOLUME control or connect components to the input jacks.
- **Muting of PRE OUT jack, HEADPHONE jack and SPEAKER terminals**
  The PRE OUT jack, HEADPHONE jack and SPEAKER terminals include a muting circuit. Because of this, the output signals are greatly reduced for several seconds after the power operation switch is turned on or input function, surround mode or any other set-up is changed. If the volume is turned up during this time, the output will be very high after the muting circuit stops functioning. Always wait until the muting circuit turns off before adjusting the volume.
- **Whenever the power operation switch is in the ■ OFF or STANDBY state, the apparatus is still connected on some AC line voltages.**
  Please be sure to unplug the cord when you leave home for, say, a vacation.

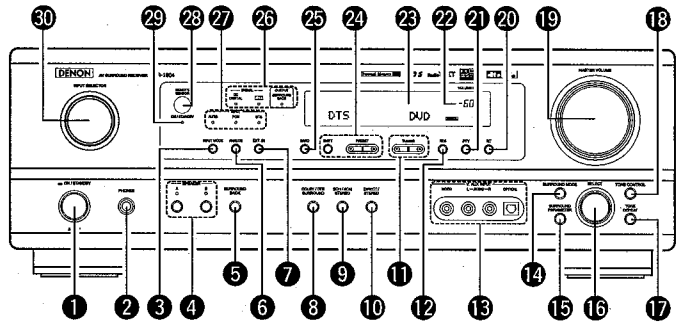
4 FEATURES

1. **Dolby Digital EX decoder system**
   Dolby Digital EX is a 6.1-channel surround format proposed by Dolby Laboratories that allows users to enjoy in their homes the "DOLBY DIGITAL SURROUND EX" audio format jointly developed by Dolby Laboratories and Lucas Films and first used for the movie "Star Wars Episode 1 – Phantom Menace".
   The 6.1 channels of sound, including surround back channels, provide improved sound positioning and expression of space.
2. **DTS-ES Extended Surround and DTS Neo:6**
   The AVR-1604 is compatible with DTS-ES Extended Surround, a new multi-channel format developed by Digital Theater Systems Inc.
   The AVR-1604 is also compatible with DTS Neo:6, a surround mode allowing 6.1-channel playback of regular stereo sources.
3. **Dolby Pro Logic II decoder**
   Dolby Pro Logic II is a new format for playing multichannel audio signals that offers improvements over conventional Dolby Pro Logic. It can be used to decode not only sources recorded in Dolby Surround but also regular stereo sources into five channels (front left/right, center and surround left/right). In addition, various parameters can be set according to the type of source and the contents, so you can adjust the sound field with greater precision.
4. **Dolby Digital decoder**
   Dolby Digital, a digital discrete system in which the different channels are completely independent, recreates "three-dimensional" sound fields (sounds with a sense of distance, movement and position) with no crosstalk between channels for greater reality. In addition, the 5 channels (excluding the 0.1 channel for low frequency effects) have a playback range extending to 20 kHz, the same as the range of CDs, thus resulting in clearer, more richly expressive sound.
5. **DTS (Digital Theater Systems)**
   DTS provides up to 5.1 channels of wide-range, high fidelity surround sound, from sources such as laser disc, DVD and specially-encoded music discs.
6. **Auto Surround Mode**
   This function stores the surround mode last used for an input signal in the memory and automatically sets that surround mode the next time that signal is input.
7. **6CH EXT. IN jacks**
   This unit is equipped with 6CH EXT. IN jacks for use with audio formats of the future.
8. **High performance DSP simulates 7 sound fields**
   Playback is possible in 7 surround modes: 5/6-channel Stereo, Mono Movie, Rock Arena, Jazz Club, Video Game, Matrix and Virtual. You can enjoy a variety of sound effects for different movie scenes and program sources even with stereo sources not in Dolby Surround.
9. **Personal Memory Plus function**
   Personal Memory Plus is an advanced version of Personal Memory. With Personal Memory Plus, the set automatically memorizes the surround mode, channel volume, surround parameters, etc., for each of the separate input sources.

5 PART NAMES AND FUNCTIONS

Front Panel

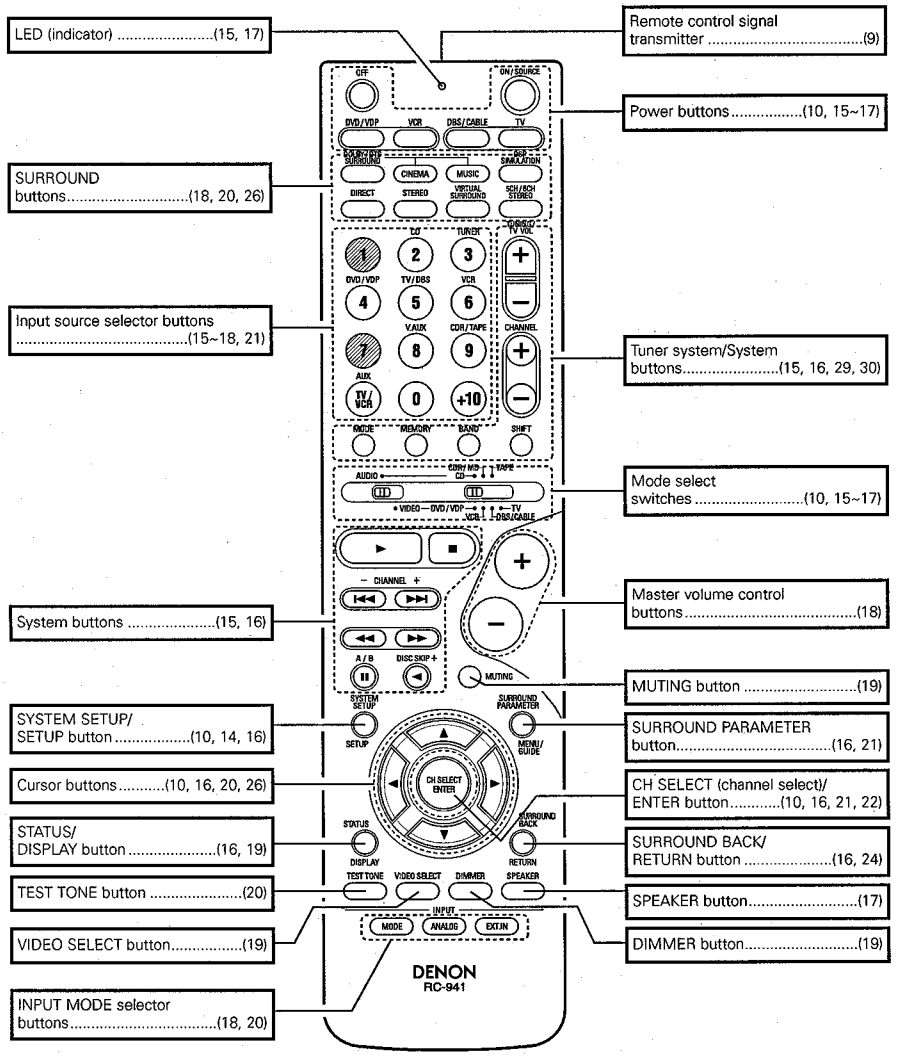
• For details on the functions of these parts, refer to the pages given in parentheses ( ).



❶ Power operation switch .....(17, 29, 32)
❷ Headphones jack (PHONES) .....(19)
❸ INPUT MODE button .....(18, 20, 24)
❹ SPEAKER A/B buttons .....(17, 32)
❺ SURROUND BACK button .....(24)
❻ ANALOG button .....(18, 20)
❼ EXT. IN button .....(18, 20)
❽ DOLBY/DTS SURROUND button.....(20, 21 24)
❾ 5CH/6CH STEREO button .....(26, 27)
❿ DIRECT/STEREO button.....(26)
⓫ TUNING UP/DOWN buttons .....(29)
⓬ RDS button.....(31)
⓭ V. AUX input jacks .....(3, 7)
⓮ SURROUND MODE button.....(18, 27)
⓯ SURROUND PARAMETER button .....(21, 26)
⓰ SELECT knob .....(18, 21, 27)
⓱ TONE DEFEAT button .....(19)
⓲ TONE CONTROL button .....(19)
⓳ MASTER VOLUME control .....(18)
⓴ RT button.....(32)
㉑ PTY button.....(31)
㉒ MASTER VOLUME indicator.....(18)
㉓ Display
㉔ Preset station select buttons .....(29, 30)
㉕ BAND button .....(29)
㉖ OUTPUT indicator.....(24)
㉗ SIGNAL indicator .....(18)
㉘ Remote control sensor (REMOTE SENSOR) .....(9)
㉙ Power operation indicator (ON/STANDBY)
㉚ INPUT SELECTOR knob .....(18)

Remote control unit

• For details on the functions of these parts, refer to the pages given in parentheses ( ).


LED (indicator) .....(15, 17)
Remote control signal transmitter .....(9)
Power buttons.....(10, 15~17)
SURROUND buttons.....(18, 20, 26)
Input source selector buttons .....(15~18, 21)
Tuner system/System buttons.....(15, 16, 29, 30)
Mode select switches .....(10, 15~17)
Master volume control buttons.....(18)
System buttons .....(15, 16)
MUTING button .....(19)
SYSTEM SETUP/ SETUP button.....(10, 14, 16)
SURROUND PARAMETER button.....(16, 21)
Cursor buttons.....(10, 16, 20, 26)
CH SELECT (channel select)/ ENTER button.....(10, 16, 21, 22)
STATUS/ DISPLAY button.....(16, 19)
SURROUND BACK/ RETURN button .....(16, 24)
TEST TONE button .....(20)
SPEAKER button.....(17)
VIDEO SELECT button.....(19)
DIMMER button.....(19)
INPUT MODE selector buttons.....(18, 20)
DENON
RC-941

NOTE:
• The shaded button ▨ does not function with the AVR-1604. (Nothing happens when they are pressed.)

6 READ THIS FIRST

This AV Surround Receiver must be setup before use. Following these steps.

Step 1 **(page 5 to 9)**
Choose the best location to setup the speakers and connecting the components.

Step 2 **(page 9)**
Next, insert the batteries into the remote control unit.

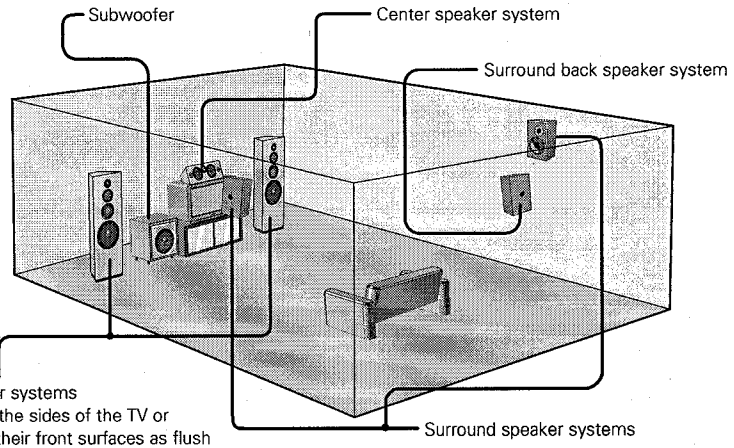
Step 3 **(page 10 to 14)**
Finally, setting up the system.

7 SETTING UP THE SPEAKER SYSTEMS

■ Speaker system layout

Basic system layout

• The following is an example of the basic layout for a system consisting of seven speaker systems and a television monitor:

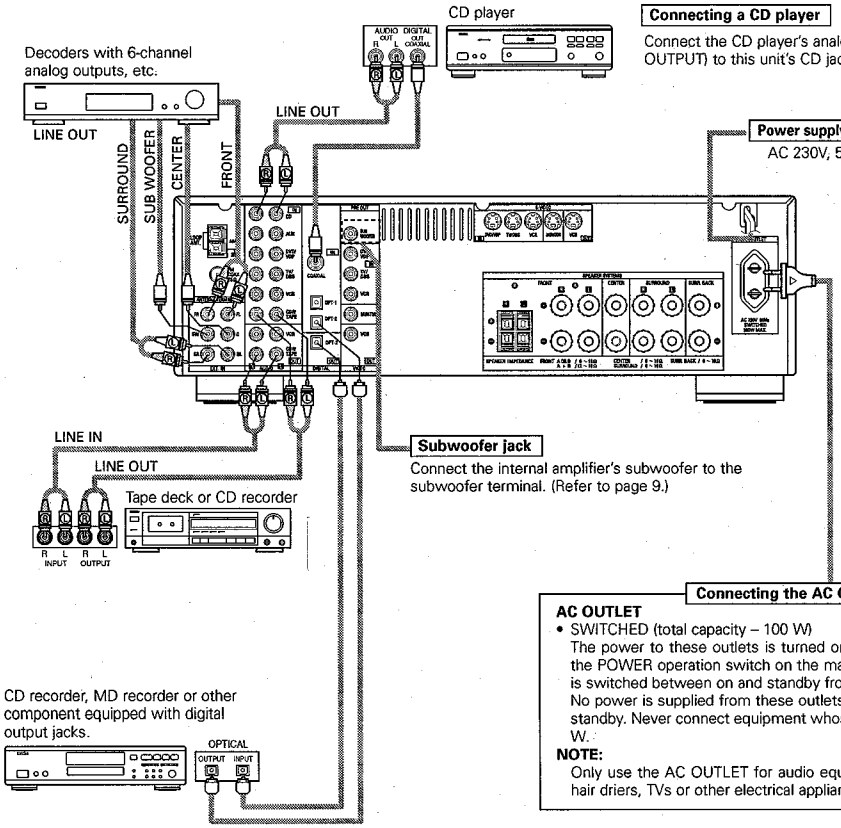

Subwoofer
Center speaker system
Surround back speaker system
Front speaker systems
Set these at the sides of the TV or screen with their front surfaces as flush with the front of the screen as possible.
Surround speaker systems

8 CONNECTIONS

- Do not plug in the power supply cord until all connections have been completed.
- Be sure to connect the left and right channels properly (left with left, right with right).
- Insert the plugs securely. Incomplete connections will result in the generation of noise.
- **Use the AC OUTLET for audio equipment only. Do not use them for hair driers, etc.**
- Note that binding pin plug cords together with power supply cords or placing them near a power transformer will result in generating hum or other noise.
- Noise or humming may be generated if a connected audio equipment is used independently without turning the power of this unit on. If this happens, turn on the power of the this unit.

- Analog recording of signals input to the AVR-1604 in digital format is not possible. To record in analog, also connect the analog signals of the player to the AVR-1604's analog input terminals.
- The AVR-1604's OPTICAL OUT terminal is an optical digital output terminal for connection of a CD recorder, MD recorder or other digital recording device. Use it for digital recording.

Connecting the audio components



Connecting a CD player

Connect the CD player's analog output jacks (ANALOG OUTPUT) to this unit's CD jacks using pin plug cords.

Power supply cord

AC 230V, 50Hz

Connecting a Tape deck

Connections for recording:
Connect the tape deck's recording input jacks (LINE IN or REC) to this unit's tape recording (OUT) jacks using pin plug cords.
Connections for playback:
Connect the tape deck's playback output jacks (LINE OUT or PB) to this unit's tape playback (IN) jacks using pin plug cords.

Subwoofer jack

Connect the internal amplifier's subwoofer to the subwoofer terminal. (Refer to page 9.)

Connecting the AC OUTLET

AC OUTLET
- SWITCHED (total capacity – 100 W)
  The power to these outlets is turned on and off in conjunction with the POWER operation switch on the main unit, and when the power is switched between on and standby from the remote control unit. No power is supplied from these outlets when this unit's power is at standby. Never connect equipment whose total capacity is above 100 W.

NOTE:
Only use the AC OUTLET for audio equipment. Never use them for hair driers, TVs or other electrical appliances.

Connecting the DIGITAL jacks

Use these for connections to audio equipment with digital output. Refer to page 14 for instructions on setting this terminal.

NOTES:
- Use 75 Ω/ohms cable pin cords (sold separately) for coaxial connections.
- Use optical cables (sold separately) for optical connections.

Connecting the video equipments

To connect the video signal, connect using a 75 Ω/ohms video signal cable cord. Using an improper cable can result in a drop in sound quality.

Connecting a TV/DBS tuner

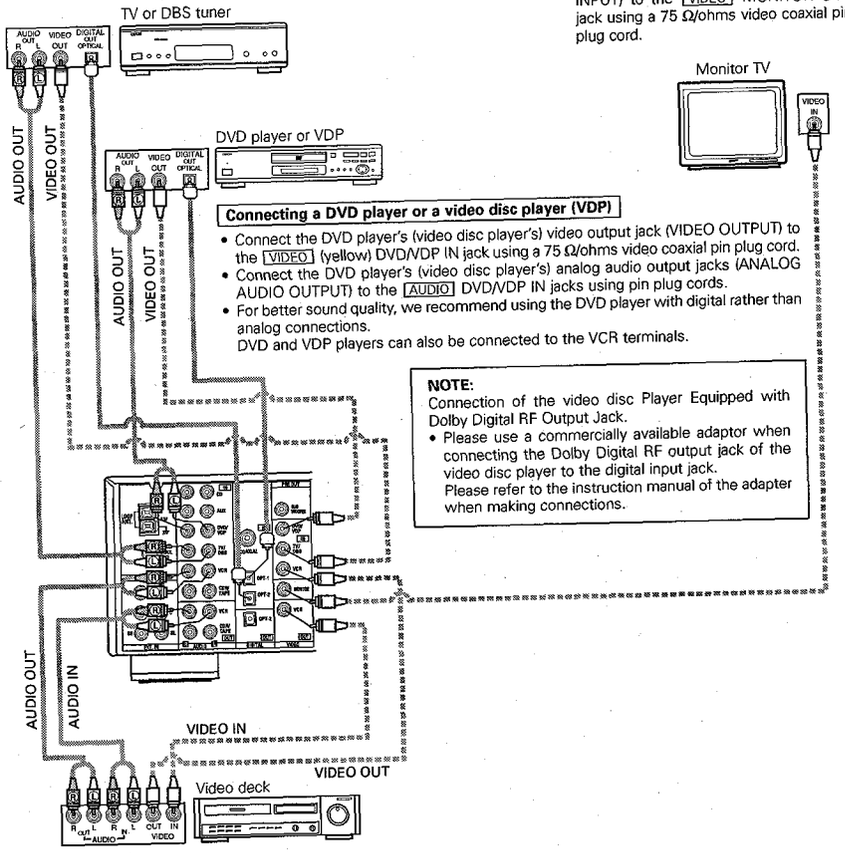
TV/DBS

- Connect the TV's or DBS tuner's video output jack (VIDEO OUTPUT) to the VIDEO (yellow) TV/DBS IN jack using a 75 Ω/ohms video coaxial pin plug cord.
- Connect the TV's or DBS tuner's audio output jacks (AUDIO OUTPUT) to the AUDIO TV/DBS IN jacks using pin plug cords.

Connecting a monitor TV

MONITOR OUT

- Connect the TV's video input jack (VIDEO INPUT) to the VIDEO MONITOR OUT jack using a 75 Ω/ohms video coaxial pin plug cord.



Connecting a DVD player or a video disc player (VDP)

- Connect the DVD player's (video disc player's) video output jack (VIDEO OUTPUT) to the VIDEO (yellow) DVD/VDP IN jack using a 75 Ω/ohms video coaxial pin plug cord.
- Connect the DVD player's (video disc player's) analog audio output jacks (ANALOG AUDIO OUTPUT) to the AUDIO DVD/VDP IN jacks using pin plug cords.
- For better sound quality, we recommend using the DVD player with digital rather than analog connections.
  DVD and VDP players can also be connected to the VCR terminals.

NOTE:
Connection of the video disc Player Equipped with Dolby Digital RF Output Jack.

- Please use a commercially available adaptor when connecting the Dolby Digital RF output jack of the video disc player to the digital input jack.
  Please refer to the instruction manual of the adapter when making connections.

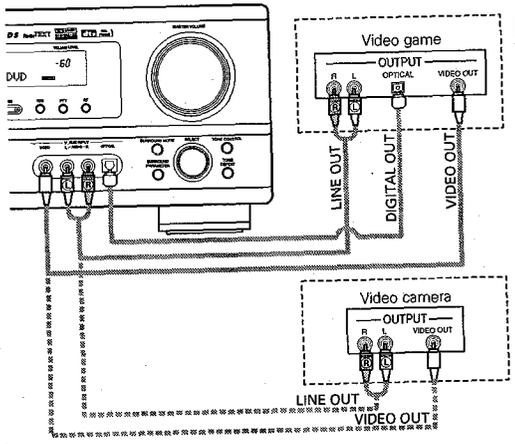
Connecting a video deck

Video input/output connections:

- Connect the video deck's video output jack (VIDEO OUT) to the VIDEO (yellow) VCR IN jack, and the video deck's video input jack (VIDEO IN) to the VIDEO (yellow) VCR OUT jack using 75 Ω/ohms video coaxial pin plug cords.

Connecting the audio output jacks:

- Connect the video deck's audio output jacks (AUDIO OUT) to the AUDIO VCR IN jacks, and the video deck's audio input jacks (AUDIO IN) to the AUDIO VCR OUT jacks using pin plug cords.



Connecting a Video game equipment

- Connect the Video game equipment's output jacks to this unit's V. AUX INPUT jacks.

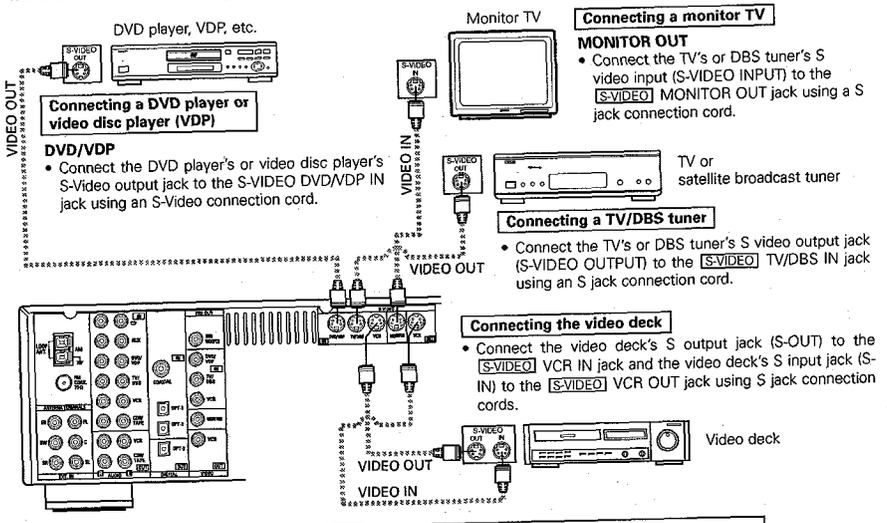
Connecting a Video camera equipment

- Connect the video camera equipment's output jacks to this unit's V. AUX INPUT jacks.

※ The V. AUX terminal is covered with a cap. Remove this cap in order to use the terminal. (See page 3 for instructions on removing the cap.)

Connecting a video component equipped with S-video jacks

- When marking connections, also refer to the operating instructions of the other components.
- **A note on the S input jacks**
  The input selectors for the S inputs and pin jack inputs work in conjunction with each other.
- **Precaution when using S-jacks**
  This unit's S-jacks (input and output) and video pin jacks (input and output) have independent circuit structures, so that video signals input from the S-jacks are only output from the S-jack outputs and video signals input from the pin jacks are only output from the pin jack outputs.
  When connecting this unit with equipment that is equipped with S-jacks, keep the above point in mind and make connections according to the equipment's instruction manuals.



Connecting a monitor TV

MONITOR OUT

- Connect the TV's or DBS tuner's S video input (S-VIDEO INPUT) to the S-VIDEO MONITOR OUT jack using a S jack connection cord.

Connecting a DVD player or video disc player (VDP)

DVD/VDP

- Connect the DVD player's or video disc player's S-Video output jack to the S-VIDEO DVD/VDP IN jack using an S-Video connection cord.

Connecting a TV/DBS tuner

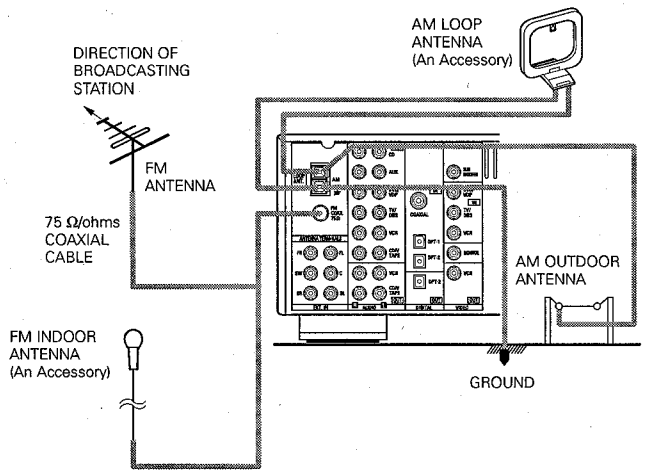
- Connect the TV's or DBS tuner's S video output jack (S-VIDEO OUTPUT) to the S-VIDEO TV/DBS IN jack using an S jack connection cord.

Connecting the video deck

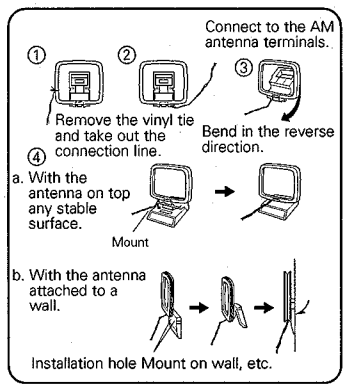
- Connect the video deck's S output jack (S-OUT) to the S-VIDEO VCR IN jack and the video deck's S input jack (S-IN) to the S-VIDEO VCR OUT jack using S jack connection cords.

Connect the components' audio inputs and outputs as described on page 7.

Connecting the antenna terminals

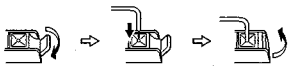


AM loop antenna assembly


Connect to the AM antenna terminals.
①
②
③
Remove the vinyl tie and take out the connection line.
④
Bend in the reverse direction.
a. With the antenna on top any stable surface.
Mount
b. With the antenna attached to a wall.
Installation hole Mount on wall, etc.

Connection of AM antennas

1. Push the lever. 2. Insert the conductor. 3. Return the lever.



NOTES:
- Do not connect two FM antennas simultaneously.
- Even if an external AM antenna is used, do not disconnect the AM loop antenna.
- Make sure AM loop antenna lead terminals do not touch metal parts of the panel.

Speaker system connections

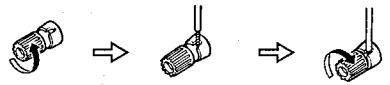
- Connect the speaker terminals with the speakers making sure that like polarities are matched (⊕ with ⊕ , ⊖ with ⊖). Mismatching of polarities will result in weak central sound, unclear orientation of the various instruments, and the sense of direction of the stereo being impaired.
- When making connections, take care that none of the individual conductors of the speaker cord come in contact with adjacent terminals, with other speaker cord conductors, or with the rear panel.

NOTE:
NEVER touch the speaker terminals when the power is on.
Doing so could result in electric shocks.

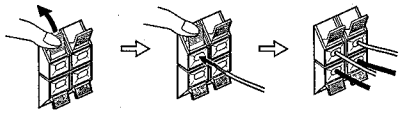
Speaker Impedance
- When speaker systems A and B are use separately, speakers with an impedance of 6 to 16 Ω/ohms can be connected for use as front speakers.
- Be careful when using two pairs of front speakers (A + B) at the same time, since use of speakers with an impedance of 12 to 16 Ω/ohms.
- Speakers with an impedance of 6 to 16 Ω/ohms can be connected for use as center, surround and surround back speakers.
- The protector circuit may be activated if the set is played for long periods of time at high volumes when speakers with an impedance lower than the specified impedance are connected.

Connecting the speaker cords

1. Loosen by turning counterclockwise. 2. Insert the cord. 3. Tighten by turning clockwise.



1. Push the lever. 2. Insert the cord. 3. Return the lever.

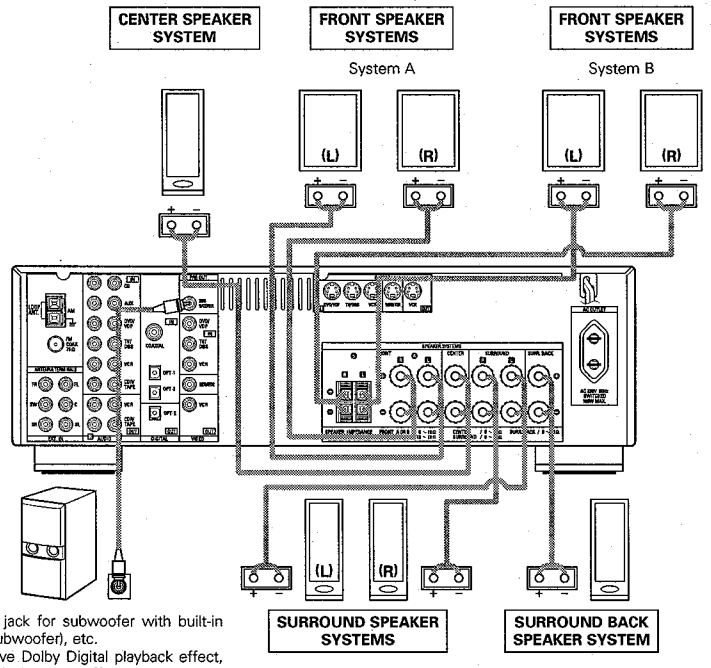


Protector circuit

- This unit is equipped with a high-speed protection circuit. The purpose of this circuit is to protect the speakers under circumstances such as when the output of the power amplifier is inadvertently short-circuited and a large current flows, when the temperature surrounding the unit becomes unusually high, or when the unit is used at high output over a long period which results in an extreme temperature rise.
When the protection circuit is activated, the speaker output is cut off and the power supply indicator LED flashes. Should this occur, please follow these steps: be sure to switch off the power of this unit, check whether there are any faults with the wiring of the speaker cables or input cables, and wait for the unit to cool down if it is very hot. Improve the ventilation condition around the unit and switch the power back on. If the protection circuit is activated again even though there are no problems with the wiring or the ventilation around the unit, switch off the power and contact a DENON service center.

Note on speaker impedance

- The protector circuit may be activated if the set is played for long periods of time at high volumes when speakers with an impedance lower than the specified impedance (for example speakers with an impedance of lower than 4 Ω/ohms) are connected. If the protector circuit is activated, the speaker output is cut off. Turn off the set's power, wait for the set to cool down, improve the ventilation around the set, then turn the power back on.



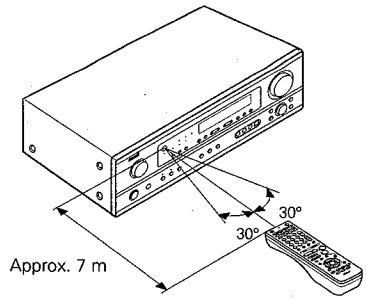
Connection jack for subwoofer with built-in amplifier (subwoofer), etc.
※ To achieve Dolby Digital playback effect, use a unit that can sufficiently reproduce frequencies of under 80 Hz.

- **Precautions when connecting speakers**
  If a speaker is placed near a TV or video monitor, the colors on the screen may be disturbed by the speaker's magnetism. If this should happen, move the speaker away to a position where it does not have this effect.

9 USING THE REMOTE CONTROL UNIT

Following the procedure outlined below, insert the batteries before using the remote control unit.

Range of operation of the remote control unit

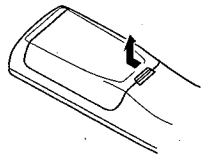


Point the remote control unit at the remote control sensor as shown on the diagram at the left.

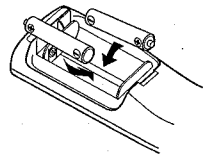
NOTES:
- The remote control unit can be used from a straight distance of approximately 7 meters, but this distance will shorten or operation will become difficult if there are obstacles between the remote control unit and the remote control sensor, if the remote control sensor is exposed to direct sunlight or other strong light, or if operated from an angle.
- Neon signs or other devices emitting pulse-type noise nearby may result in malfunction, so keep the set as far away from such devices as possible.

Inserting the batteries

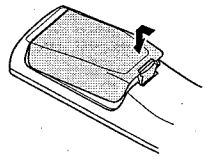
① Press as shown by the arrow and slide off.



② Insert the R6P/AA batteries properly, as shown on the diagram.



③ Close the lid.

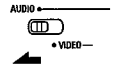


NOTES:
- Use only R6P/AA batteries for replacement.
- Be sure the polarities are correct. (See the illustration inside the battery compartment.)
- Remove the batteries if the remote control transmitter will not be used for an extended period of time.
- If batteries leak, dispose of them immediately. Avoid touching the leaked material or letting it come in contact with clothing, etc. Clean the battery compartment thoroughly before installing new batteries.
- Have replacement batteries on hand so that the old batteries can be replaced as quickly as possible when the time comes.
- Even if less than a year has passed, replace the batteries with new ones if the set does not operate even when the remote control unit is operated nearby the set. (The included battery is only for verifying operation. Replace it with a new battery as soon as possible.)

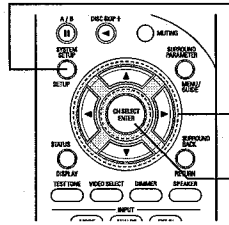
10 SETTING UP THE SYSTEM

- Once all connections with other AV components have been completed as described in "CONNECTIONS" (see pages 6 to 9), make the various settings described below on the display.
  These settings are required to set up the listening room's AV system centered around the this unit.

1 Set the slide switch to "AUDIO".



2 Use the following buttons to set up the system:



SYSTEM SETUP button
Press this to display the system setup on the display.

CURSOR buttons (▲, ▼, ◀, ▶)
Press this change what appears on the display.

ENTER button
Press this to switch the display.
Also use this button to complete the setting.

- System setup items and default values (set upon shipment from the factory)

System setup			Default settings							
Speaker Configuration	Input the combination of speakers in your system and their corresponding sizes (SMALL for regular speakers, LARGE for full-size, full-range) to automatically set the composition of the signals output from the speakers and the frequency response.		Front Sp.	Center Sp.	Surround Sp.	Surround Back Sp.	Subwoofer			
			Large	Small	Small	Small	Yes			
Subwoofer Mode	This selects the subwoofer speaker for playing deep bass signals.		Subwoofer mode = Normal							
Crossover Frequency	Set the frequency (Hz) below which the bass sound of the various speakers is to be output from the subwoofer.		80 Hz							
Delay Time	This parameter is for optimizing the timing with which the audio signals are produced from the speakers and subwoofer according to the listening position.		Front L	Front R	Center	Surround L	Surround R	Surround Back	Subwoofer	
			3.6 m	3.6 m	3.6 m	3.0 m	3.0 m	3.0 m	3.6 m	
Test Tone	This adjusts the volume of the signals output from the speakers and subwoofer for the different channels in order to obtain optimum effects.		Front L	Front R	Center	Surround L	Surround R	Surround Back	Subwoofer	
			0 dB	0 dB	0 dB	0 dB	0 dB	0 dB	0 dB	
Digital In Assignment	This assigns the digital input jacks for the different input sources.	Input source	COAXIAL		OPTICAL 1		OPTICAL 2			
		Digital Inputs	CD		DVD/VDP		TV/DBS			
Auto Surround Mode	Auto surround mode function setting.		Auto Surround Mode = ON							
Ext. In SW Level	Set the Ext. In Subwoofer channel playback level.		Ext. In SW Level = +15 dB							

NOTE:
- The system setup is not displayed when "HEADPHONE ONLY" is selected.

Before setting up the system

1

(Main unit)

Check that all the components are correct, then press the POWER operation switch on the main unit to turn on the power.

2

Press the SYSTEM SETUP button to enter the setting.

*SYSTEM SET UP

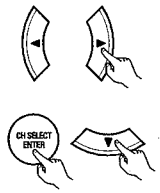
NOTE: Please make sure the "AUDIO" position of the slide switch on the remote control unit.

3

Press the ENTER or ▽ (down) button to switch to the speaker configuration set up.

NOTE:
- Press the SYSTEM SETUP button again to finish system set up. System set up can be finished at any time. The changes to the settings made up to that point are entered.

Setting the speaker configuration

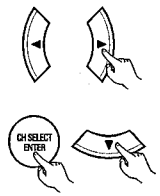
1 

Use the ◁ (left) and ▷ (right) buttons to select your front speaker type.

1 FRONT LARGE

(Initial)
LARGE | SMALL
◁ (left button) ▷ (right button)

Press the ENTER or ▽ (down) button to switch to the center speaker setting.

2 

Use the ◁ (left) and ▷ (right) buttons to select your center speaker type.

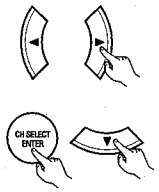
2 CENTER SMALL

(Initial)
LARGE | SMALL | NONE
◁ (left button) ▷ (right button)

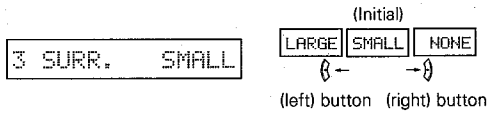
Press the ENTER or ▽ (down) button to switch to the surround speaker setting.

NOTE:
- When "Small" has been selected for the front speakers, "Large" cannot be selected for the center speaker.

3



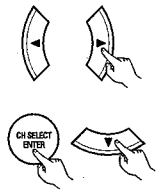
Use the ◀ (left) and ▶ (right) buttons to select your surround speaker type.



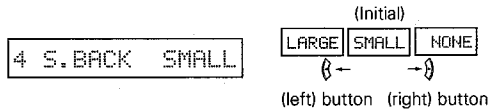
Press the ENTER or ▼ (down) button to switch to the surround back speaker setting.

NOTE:
- When "Small" has been selected for the front speakers, "Large" cannot be selected for the surround speakers.

4



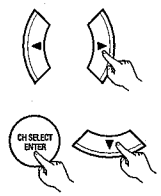
Use the ◀ (left) and ▶ (right) buttons to select your surround back speaker type.



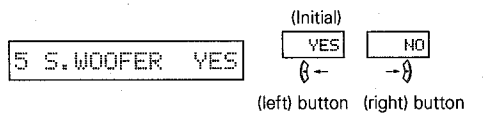
Press the ENTER or ▼ (down) button to switch to the subwoofer setting.

NOTE:
- When "Small" has been selected for the surround speakers, "Large" cannot be selected for the surround back speakers.

5



Use the ◀ (left) and ▶ (right) buttons to select your subwoofer setting.



Press the ENTER or ▼ (down) button to enter the settings and switch to the subwoofer mode setting.

- **Parameters**

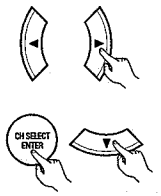
Large..... Select this when using speakers that can fully reproduce low sounds of below 80 Hz.
Small..... Select this when using speakers that cannot reproduce low sounds of below 80 Hz with sufficient volume. When this setting is selected, low frequencies of below 80 Hz are assigned to the subwoofer.
None..... Select this when no speakers are installed.
Yes/No.... Select "Yes" when a subwoofer is installed, "No" when it's not installed.

NOTE:
Select "Large" or "Small" not according to the physical size of the speaker, but according to the bass reproduction capacity at 80 Hz. If you cannot determine the best setting, try comparing the sound when set to "Small" and when set to "Large", at a level that will not damage the speakers.

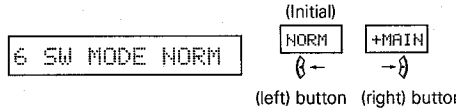
Caution:
In case the subwoofer is not used, be sure to set "Subwoofer = No", or the bass sound of front channel is divided to subwoofer channel and not reproduced in some mode.

Setting the Subwoofer mode and Crossover Frequency

1

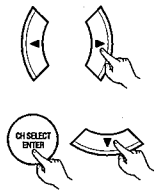


Use the ◀ (left) and ▶ (right) buttons to select the Subwoofer mode.

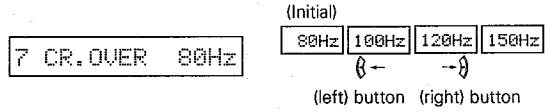


Press the ENTER or ▼ (down) button to enter the setting and switch to the Crossover Frequency setting.

2



Use the ◀ (left) and ▶ (right) buttons to select the Crossover Frequency.



Press the ENTER or ▼ (down) button to enter the setting and switch to the SPEAKER DISTANCE setting.

NOTES:

— Assignment of low frequency signal range —
- The signals produced from the subwoofer channel are LFE signals (during playback of Dolby Digital or DTS signals) and the low frequency signal range of channels set to "SMALL" in the setup. The low frequency signal range of channels set to "LARGE" are produced from those channels.

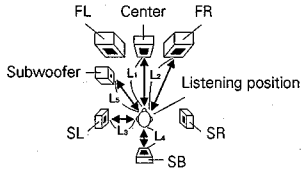
— Crossover Frequency —
- When "Subwoofer" is set to "Yes" at the "Speaker Configuration Setting", set the frequency (Hz) below which the bass sound of the various speakers is to be output from the subwoofer (the crossover frequency).
- For speakers set to "Small", sound with a frequency below the crossover frequency is cut, and the cut bass sound is output from the subwoofer instead.
  NOTE: For ordinary speaker systems, we recommend setting the crossover frequency to 80 Hz. When using small speakers, however, setting the crossover frequency to a high frequency may improve frequency response for frequencies near the crossover frequency.

— Subwoofer mode —
- The subwoofer mode setting is only valid when "LARGE" is set for the front speakers and "YES" is set for the subwoofer in the "Speaker Configuration" settings (see pages 10, 11).
  If "SMALL" is set for the front speakers or "NO" is set for the subwoofer, the subwoofer mode setting does not affect playback of low frequency signal range.
- When the "+MAIN" playback mode is selected, the low frequency signal range of channels set to "LARGE" are produced simultaneously from those channels and the subwoofer channel.
  In this playback mode, the low frequency range expand more uniformly through the room, but depending on the size and shape of the room, interference may result in a decrease of the actual volume of the low frequency range.
- When the "NORM" playback mode is selected, the low frequency signal range of channels set to "LARGE" are only produced from those channels. In this playback mode there tends to be little interference of the low frequency range in the room.
- Try playing the music or movie source and select the playback mode providing the stronger low frequency range sound.

Setting the delay time

• Input the distance between the listening position and the different speakers to set the delay time for the surround mode.

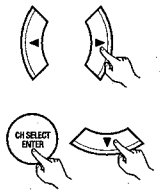
Preparations:
Measure the distances between the listening position and the speakers (L1 to L5) on the diagram at the right).
L1: Distance between center speaker and listening position
L2: Distance between front speakers and listening position
L3: Distance between surround speakers and listening position
L4: Distance between surround back speaker and listening position
L5: Distance between subwoofer and listening position



CAUTION:
※ Please note that the difference for every speaker should be 4.5 m or less.

NOTE:
• No setting when "None" has been selected for the Speaker Configuration setting.

1



Use the ◀ (left) and ▶ (right) buttons to set the distance from the front L speaker to the listening position.

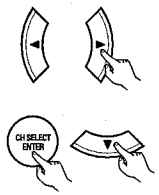
```
8 FRONT L   3.6m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the front R speaker setting.

NOTE:
• The speaker distance can be adjusted between 0 and 18 meters in steps of 0.1 meter.

2



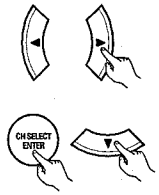
Use the ◀ (left) and ▶ (right) buttons to set the distance from the front R speaker to the listening position.

```
9 FRONT R   3.6m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the center speaker setting.

3



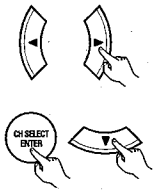
Use the ◀ (left) and ▶ (right) buttons to set the distance from the center speaker to the listening position.

```
10 CENTER   3.6m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the surround L speakers setting.

4



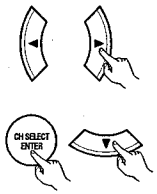
Use the ◀ (left) and ▶ (right) buttons to set the distance from the surround L speakers to the listening position.

```
11 SURR.L   3.0m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the surround R speaker setting.

5



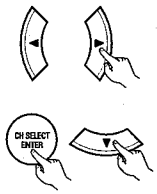
Use the ◀ (left) and ▶ (right) buttons to set the distance from the surround R speakers to the listening position.

```
12 SURR.R   3.0m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the surround back speaker setting.

6



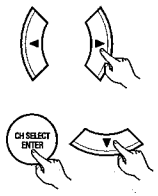
Use the ◀ (left) and ▶ (right) buttons to set the distance from the surround back speakers to the listening position.

```
13 S.BACK   3.0m
```

• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to switch to the subwoofer setting.

7



Use the ◀ (left) and ▶ (right) buttons to set the distance from the subwoofer to the listening position.

```
14 SW       3.6m
```

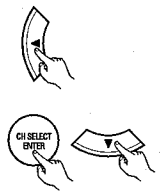
• The number changes in units of 0.1 meter each time one of the buttons is pressed. Select the value closest to the measured distance.

Press the ENTER or ▼ (down) button to enter the setting and switch the Test Tone setting.

Setting the Test Tone

- Use this setting to adjust to that the playback level between the different channel is equal.
- From the listening position, listen to the test tones produced from the speakers to adjust the level.
- The level can also be adjusted directly from the remote control unit. (For details, see page 20.)

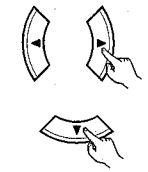
1



- Use the ◁ (left) button to switch the Test Tone mode.
- Press the ENTER or ▽ (down) button to switch to the DIGITAL input (COAX) setting.

```
15 T.TONE  <YES
```

2



Use the ◁ (left) and ▷ (right) buttons to select the Test Tone mode.

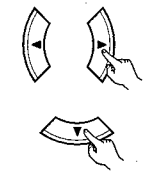
```
T.TONE  AUTO
```

(Initial)
AUTO (◁ left button) MANUAL (▷ right button)

Press the ▽ (down) button to start Test Tone.

- Auto:
  Adjust the level while listening to the test tones produced automatically from the different speakers.
- Manual:
  Select the speaker from which you want to produce the test tone to adjust the level.

3



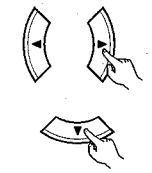
Use the ◁ (left) and ▷ (right) buttons to set the front L channel level.

```
AUTO-FL
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the center channel level (manual mode).

4



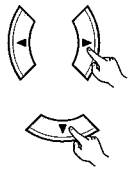
Use the ◁ (left) and ▷ (right) buttons to set the center channel level.

```
AUTO-C
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the front R channel level (manual mode).

5



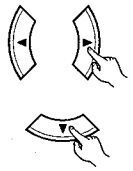
Use the ◁ (left) and ▷ (right) buttons to set the front R channel level.

```
AUTO-FR
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the surround R channel level (manual mode).

6



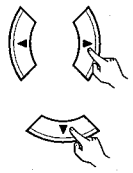
Use the ◁ (left) and ▷ (right) buttons to set the surround R channel level.

```
AUTO-SR
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the surround back channel level (manual mode).

7



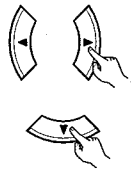
Use the ◁ (left) and ▷ (right) buttons to set the surround back channel level.

```
AUTO-SB
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the surround L channel level (manual mode).

8



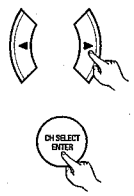
Use the ◁ (left) and ▷ (right) buttons to set the surround L channel level.

```
AUTO-SL
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

Press the ▽ (down) button to switch to the subwoofer channel level (manual mode).

9

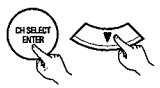


Use the ◁ (left) and ▷ (right) buttons to set the subwoofer channel level.

```
AUTO-SW
```

(Initial)
-12dB | 0dB | +12dB
◁ left button ▷ right button

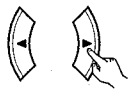
Press the ENTER button to finish the Test Tone.

10 

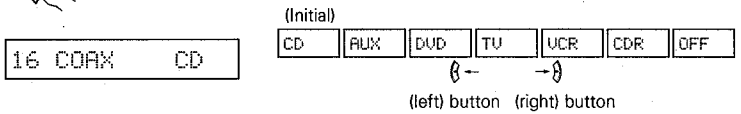
Press the ▽ (down) button to switch the DIGITAL input (COAX) setting.

Setting the Digital In assignment

Input the type of components connected to the digital input terminals.

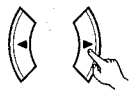
1 

Use the ◁ (left) and ▷ (right) buttons to assign the input function connected to the COAXIAL input (COAXIAL) terminal.

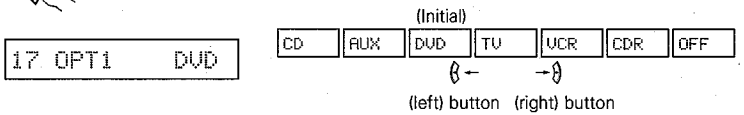


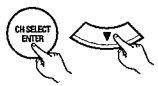
• Select "OFF" if nothing is connected.

Press the ENTER or ▽ (down) button to switch the optical input 1 (OPT1) setting.

2 

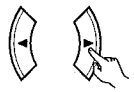
Use the ◁ (left) and ▷ (right) buttons to assign the input function connected to the OPTICAL input 1 (OPTICAL 1) terminal.



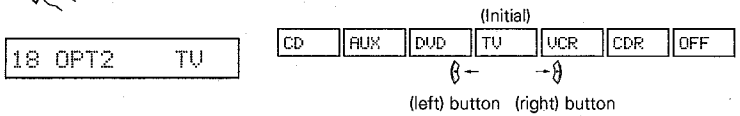


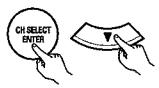
• Select "OFF" if nothing is connected.

Press the ENTER or ▽ (down) button to switch the optical input 2 (OPT2) setting.

3 

Use the ◁ (left) and ▷ (right) buttons to assign the input function connected to the OPTICAL input 2 (OPTICAL 2) terminal.





• Select "OFF" if nothing is connected.

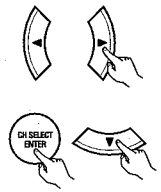
Press the ENTER or ▽ (down) button to switch the auto surround mode setting.

NOTE:
• TUNER, V. AUX cannot be selected.

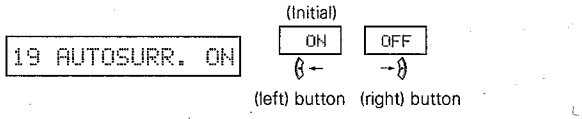
Setting the Auto Surround Mode

For the three kinds of input signals as shown below, the surround mode played the last is stored in the memory. At next time it the same signal inputs, the memorized surround mode is automatically selected and the signal is played.
Note that the surround mode setting is also stored separately for the different input function.

	SIGNAL	Default Auto Surround Mode
①	Analog and PCM 2-channel signals	STEREO
②	2-channel signals of Dolby Digital, DTS or other multichannel format	Dolby PLII Cinema
③	Multichannel signals of Dolby Digital, DTS or other multichannel format	Dolby or DTS Surround

1 

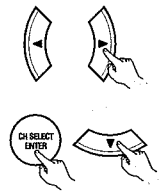
Use the ◁ (left) and ▷ (right) buttons to select the Auto Surround mode.



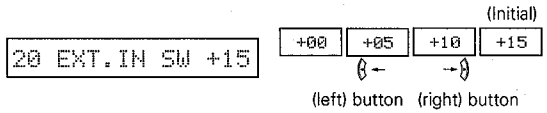
Press the ENTER or ▽ (down) button to switch the Ext. In SW Level setting.

Setting the Ext. In SW Level

Set the method of playback of the analog input signal connected to the Ext. In terminal.

1 

Use the ◁ (left) and ▷ (right) buttons to select the Ext. In Subwoofer channel Level playback.



Press the ENTER or ▽ (down) button if you want to start the settings over from the beginning.

After setting up the system

1

Press the SYSTEM SETUP button to finish system set up.

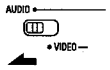
This completes the system setup operations. Once the system is set up, there is no need to make the settings again unless other components or speakers are connected to or the speaker layout is changed.

11 REMOTE CONTROL UNIT

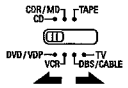
Operating DENON audio components

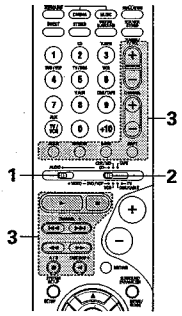
• Turn on the power of the different components before operating them.

1 Set mode switch 1 to "AUDIO".



2 Set mode switch 2 to the position for the component to be operated. (CD, CDR/MD or Tape deck)



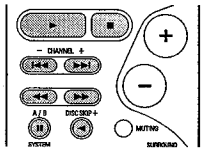


3 Operate the audio component.

• For details, refer to the component's operating instructions.

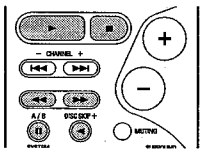
※ While this remote control is compatible with a wide range of infrared controlled components, some models of components may not be operated with this remote control.

1. CD player (CD) and CD recorder and MD recorder (CDR/MD) system buttons



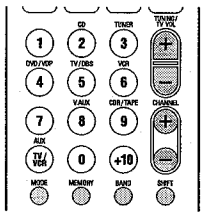
◄◄, ►► : Manual search (forward and reverse)
■ : Stop
► : Play
I◄◄, ►►I : Auto search (cue)
II : Pause
DISC SKIP + : Switch discs (for CD changers only)

2. Tape deck (TAPE) system buttons



◄◄ : Rewind
►► : Fast-forward
■ : Stop
► : Forward play
◄ : Reverse play
A/B : Switch between decks A and B

3. Tuner system buttons



SHIFT : Switch preset channel range
CHANNEL +, – : Preset channel up/down
TUNING +, – : Frequency up/down
BAND : Switch between the AM and FM bands
MODE : Switch between auto and mono
MEMORY : Preset memory

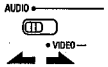
NOTE:

• TUNER can be operated when the switch is at "AUDIO" position.

Preset memory

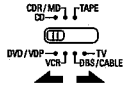
DENON and other makes of components can be operated by setting the preset memory.
This remote control unit can be used to operate components of other manufacturers without using the learning function by registering the manufacturer of the component as shown on the List of Preset Codes (pages 248~250).
Operation is not possible for some models.

1 Set mode switch 1 to "AUDIO" or "VIDEO".



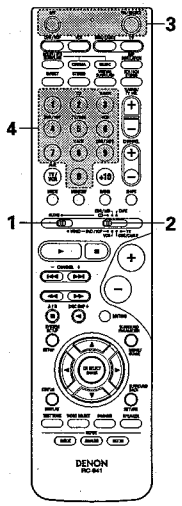
Set the AUDIO side for the CD, Tape deck or CDR/MD position, to the VIDEO side for the DVD/VDP, DBS/CABLE, VCR or TV position.

2 Set mode switch 2 to the component to be registered.



3 Press the ON/SOURCE button and the OFF button at the same time.

• Indicator flash.



4 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

Referring to the included List of Preset Codes, use the number buttons to input the preset code (a 3-digit number) for the manufacturer of the component whose signals you want to store in the memory.

5 To store the codes of another component in the memory, repeat steps 1 to 4.

NOTES:

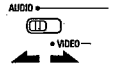
• The signals for the pressed buttons are emitted while setting the preset memory. To avoid accidental operation, cover the remote control unit's transmitting window while setting the preset memory.
• Depending on the model and year of manufacture, this function cannot be used for some models, even if they are of makes listed on the included list of preset codes.
• Some manufacturers use more than one type of remote control code. Refer to the included list of preset codes to change the number and check.
• **The preset memory can be set for one component only among the following: CDR/MD, DVD/VDP and DBS/CABLE.**

The preset codes are as follows upon shipment from the factory and after resetting:

TV, VCR.....HITACHI
CD, TAPE.....DENON
CDR/MD.....DENON (CDR)
DVD/VDP.....DENON (DVD)
DBS/CABLE.....ABC (CABLE)

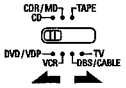
Operating component stored in the preset memory

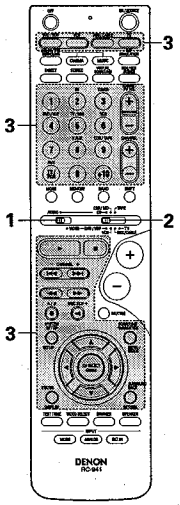
1 Set mode switch 1 to "AUDIO" or "VIDEO".



Set the AUDIO side for the CD, tape deck or CDR/MD position, to the VIDEO side for the DVD/VDP, DBS/CABLE, VCR or TV position.

2 Set mode switch 2 to the component you want to operate.



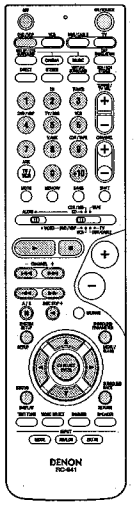


3 Operate the component.
- For details, refer to the component's operating instructions.

※ Some models cannot be operated with this remote control unit.

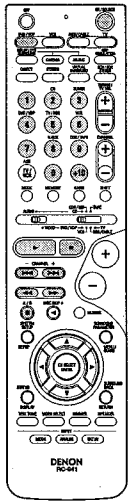
1. Digital video disc player (DVD) system buttons

POWER : Power on/standby
(ON/SOURCE)
OFF : DENON DVD Power off
◀◀, ▶▶ : Manual search (forward and reverse)
■ : Stop
▶ : Play
I◀◀, ▶▶I : Auto search (to beginning of track)
II : Pause
0 ~ 9, +10 : 10 key
DISC SKIP + : Disc skip (for DVD changer only)
DISPLAY : Switch display
MENU : Menu
RETURN : Return
SETUP : Setup
△, ▽, ◁, ▷ : Cursor up, down, left and right
ENTER : Enter setting



2. Video disc player (VDP) system buttons

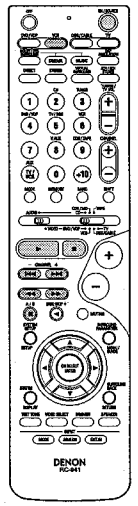
POWER : Power on/standby
(ON/SOURCE)
◀◀, ▶▶ : Manual search (forward and reverse)
■ : Stop
▶ : Play
I◀◀, ▶▶I : Auto search (cue)
II : Pause
0~9, +10 : 10 key



NOTE:
- Some manufacturers use different names for the DVD remote control buttons, so also refer to the instructions on remote control for that component.

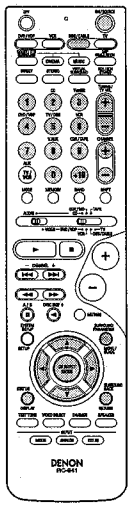
3. Video deck (VCR) system buttons

POWER : Power on/standby
(ON/SOURCE)
◀◀, ▶▶ : Manual search (forward and reverse)
■ : Stop
▶ : Play
II : Pause
Channel +, − : Channels



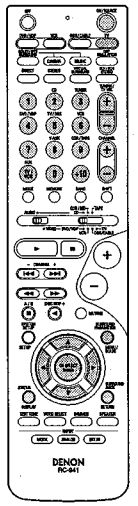
4. Digital broadcast satellite (DBS) tuner and cable (CABLE) system buttons

POWER : Power on/standby
(ON/SOURCE)
MENU : Menu
RETURN : Return
△, ▽, ◁, ▷ : Cursor up, down, left and right
ENTER : Enter
CHANNEL +, − : Switch channels
0~9, +10 : Channels
DISPLAY : Switch display
VOL +, − : Volume up/down



5. Monitor TV (TV) system buttons

POWER : Power on/standby
(ON/SOURCE)
MENU : Menu
RETURN : Return
△, ▽, ◁, ▷ : Cursor up, down, left and right
ENTER : Enter
CHANNEL +, − : Switch channels
0~9, +10 : Channels
DISPLAY : Switch display
TV/VCR : Switch between TV and video player
TV VOL +, − : Volume up/down

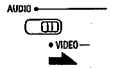


NOTES:
- For this CD, CDR, MD and TAPE components, buttons can be operated in the same way as for Denon audio components (page 15).
- The TV can be operated when the switch is at DVD/VDP, VCR, TV position. (CHANNEL, TV VOL)

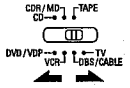
Punch Through

- "Punch Through" is a function allowing you to operate the PLAY, STOP, MANUAL SEARCH and AUTO SEARCH buttons on the CD, TAPE, CDR/MD, DVD/VDP or VCR components when in the DBS/CABLE or TV mode. By default, nothing is set.

1 Set mode switch 1 to "VIDEO".

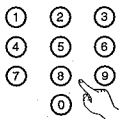


2 Set mode switch 2 to the component to be registered (DBS/CABLE or TV).



3 Press the DVD/VDP power button and the TV power button at the same time.

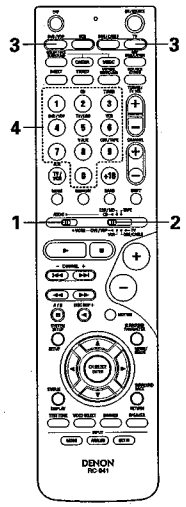
- Indicator flash.

4 

Input the number of the component you want to set. (See Table 1)

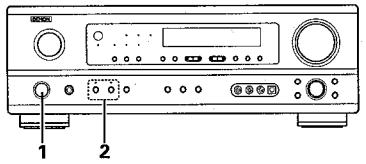
Table 1

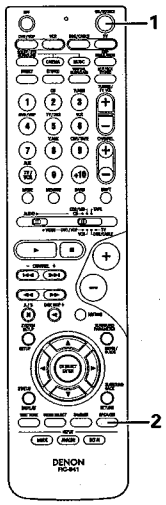
	No.
CD	1
TAPE	2
CDR/MD	3
DVD/VDP	4
VCR	5
No setting	0



12 OPERATION

Before operating





Preparations:
Check that all connections are proper.

1 Turn on the power.
Press the power operation switch (button).

(Main unit) (Remote control unit)

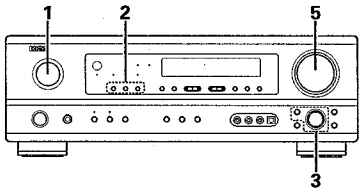
- ON/STANDBY
  The power turns on and power indicator is lit. Several seconds are required from the time the power operation switch is set to the "ON/STANDBY" position until sound is output. This is due to the built-in muting circuit that prevents noise when the power switch is turned on and off.
  Set the power operation switch to this position to turn the power on and off from the included remote control unit.
- OFF
  The power turns off and power indicator is off.
  In this position, the power cannot be turned on and off from the remote control unit.

2 Select the front speakers.
Press the SPEAKER A or B button to turn the speaker on.

(Main unit) (Remote control unit)

- The front speaker A, B setting can be also be changed with the SPEAKER button on the remote control unit.

Playing the input source



1 Select the input source to be played.

Example: CD

(Main unit) (Remote control unit)

2 Select the input mode.

- Selecting the analog mode
  Press the ANALOG button to switch to the analog input.

(Main unit) (Remote control unit)

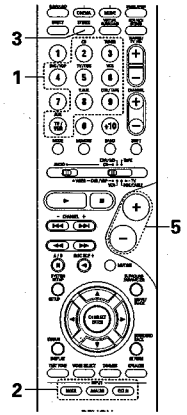
- Selecting the external input (EXT. IN) mode
  Press the EXT. IN to switch the external input.

(Main unit) (Remote control unit)

- Selecting the AUTO, PCM and DTS modes
  The mode switches as shown below each time the INPUT MODE button is pressed.

AUTO → PCM → DTS

(Main unit) (Remote control unit)



Input mode selection function

Different input modes can be selected for the different input sources. The selected input modes for the separate input sources are stored in the memory.

① AUTO (All auto mode)
In this mode, the types of signals being input to the digital and analog input jacks for the selected input source are detected and the program in the this unit's surround decoder is selected automatically upon playback. This mode can be selected for all input sources other than TUNER.
The presence or absence of digital signals is detected, the signals input to the digital input jacks are identified and decoding and playback are performed automatically in DTS, Dolby Digital or PCM (2 channel stereo) format. If no digital signal is being input, the analog input jacks are selected.
Use this mode to play Dolby Digital signals.

② PCM (exclusive PCM signal playback mode)
Decoding and playback are only performed when PCM signals are being input.
Note that noise may be generated when using this mode to play signals other than PCM signals.

③ DTS (exclusive DTS signal playback mode)
Decoding and playback are only performed when DTS signals are being input.

④ ANALOG (exclusive analog audio signal playback mode)
The signals input to the analog input jacks are decoded and played.

⑤ EXT. IN (external decoder input jack selection mode)
The signals being input to the external decoder input jacks are played without passing through the surround circuitry.

NOTE:

- Note that noise will be output when CDs or LDs recorded in DTS format are played in the "PCM" (exclusive PCM signal playback) or "ANALOG" (exclusive analog audio signal playback) mode. Select the AUTO or DTS (exclusive DTS signal playback) mode when playing signals recorded in DTS from a laser disc player.

Notes on playing a source encoded with DTS

- **Noise may be generated at the beginning of playback and while searching during DTS playback in the AUTO mode. If so, play in the DTS mode.**
- **In some rare cases the noise may be generated when you preform the operation to stop playback of a DTS-CD or DTS-LD.**

3 Select the play mode.
Press the SURROUND MODE button, then turn the SELECT knob.

Example: Stereo

(Main unit) (Remote control unit)

※ To select the surround mode while adjusting the surround parameters, tone defeat or tone control, press the SURROUND MODE button then operate the selector.

(Main unit)

4 Start playback on the selected component.

- For operating instructions, refer to the component's manual.

5 Adjust the volume.

The volume level is displayed on the master volume level display.

(Main unit) (Remote control unit)

※ The volume can be adjusted within the range of –70 to 0 to 18 dB, in steps of 1 dB. However, when the channel level is set as described on page 20, if the volume for any channel is set at +1 dB or greater, the volume cannot be adjusted up to 18 dB. (In this case the maximum volume is adjusted to "18 dB — (Maximum value of channel level)".)

Input mode when playing DTS sources

- Noise will be output if DTS-compatible CDs or LDs are played in the "ANALOG" or "PCM" mode.
  When playing DTS-compatible sources, be sure to connect the source component to the digital input jacks (OPTICAL/COAXIAL) and set the input mode to "DTS".

Input mode display

One of these lights, depending on the input signal.

- In the AUTO mode

- In the DIGITAL PCM mode

- In the DIGITAL DTS mode

- In the ANALOG mode

Input signal display

- DOLBY DIGITAL

- DTS

- PCM

※ The DIGITAL indicator lights when digital signals are being input properly. If the DIGITAL indicator does not light, check whether the digital input component setup (page 14) and connections are correct and whether the component's power is turned on.

NOTE:

- The DIGITAL indicator will light when playing CD-ROMs containing data other than audio signals, but no sound will be heard.

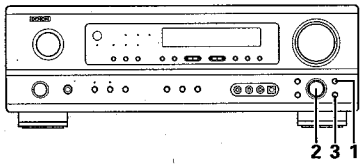
After starting playback

[1] Adjusting the sound quality (tone)

1 The tone switches as follows each time the TONE CONTROL button is pressed.

BASS ⟷ TREBLE

(Main unit)



2 With the name of the volume to be adjusted selected, turn the SELECT knob to adjust the level.

(Main unit)

- To increase the bass or treble: Turn the control clockwise. (The bass or treble sound can be increased to up to +12 dB in steps of 2 dB.)
- To decrease the bass or treble: Turn the control counterclockwise. (The bass or treble sound can be decreased to up to –12 dB in steps of 2 dB.)

3 If you do not want the bass and treble to be adjusted, turn on the tone defeat mode.

(Main unit)

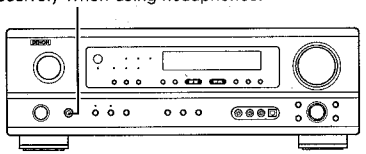
※ The signals do not pass through the bass and treble adjustment circuits, so it provides higher quality sound.

[2] Listening over headphones

1 Plug the headphones' plug into the jack.

※ Connect the headphones to the PHONES jack.
The speaker output is automatically turned off when headphones are connected.

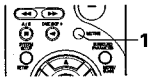
NOTE:
To prevent hearing loss, do not raise the volume level excessively when using headphones.



[3] Turning the sound off temporarily (muting)

1 Use this to turn off the audio output temporarily.
Press the MUTING button.

(Remote control unit)

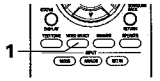


※ Cancelling MUTING mode.
- Press the MUTING button again.
- Muting will also be cancelled when MASTER VOL is adjusted up or down.

[4] Combining the currently playing sound with the desired image

1 Simulcast playback
Use this switch to monitor a video source other than the audio source.
Press the VIDEO SELECT button repeatedly until the desired source appears on the display.

(Remote control unit)

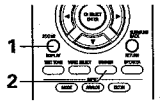


※ Cancelling simulcast playback.
- Select "SOURCE" using the video select button.
- Switch the program source to the component connected to the video input jacks.

[5] Checking the currently playing program source, etc.

1 Front panel display
- Descriptions of the unit's operations are also displayed on the front panel display. In addition, the display can be switched to check the unit's operating status while playing a source by pressing the STATUS button.

(Remote control unit)



2 Using the dimmer function
- Use this to change the brightness of the display.
The display brightness changes in four steps (bright, medium, dim and off) by pressing the main unit's DIMMER button repeatedly.

BRIGHT → MEDIUM → DIM
OFF ←

(Remote control unit)

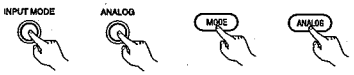
Playback using the external input (EXT. IN) jacks

1 Set the external input (EXT. IN) mode.
Press the EXT. IN to switch the external input.

(Main unit) (Remote control unit)

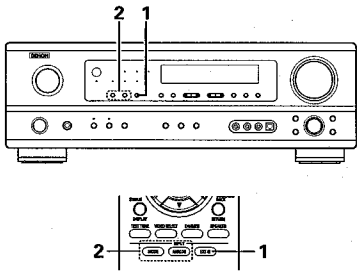
Once this is selected, the input signals connected to the FL (front left), FR (front right), C (center), SL (surround left), and SR (surround right) channels of the EXT. IN jacks are output directly to the front (left and right), center, surround (left and right) speaker systems without passing through the surround circuitry. In addition, the signal input to the SW (subwoofer) jack is output to the PRE OUT SUBWOOFER jack.

2 Cancelling the external input mode
To cancel the external input (EXT. IN) setting, press the INPUT MODE (AUTO, PCM, DTS) or ANALOG button to switch to the desired input mode. (See page 18.)



(Main unit) (Remote control unit)

- When the input mode is set to the external input (EXT. IN), the play mode (DIRECT, STEREO, DOLBY/DTS SURROUND, 5/6CH STEREO or DSP SIMULATION) cannot be selected.



NOTES:
- In play modes other than the external input mode, the signals connected to EXT. IN jacks cannot be played. In addition, signals cannot be output from channels not connected to the input jacks.
- The external input mode can be set for any input source. To watch video while listening to sound, select the input source to which the video signal is connected, then set this mode.
- If the subwoofer output level seems to high, set the "SW ATT." surround parameter to "ON".

Recording the program source (recording the source currently being monitored)

1 Follow step 1 to 3 under "Playing the input source".

2 Start recording on the tape or video deck.
For instructions, refer to the component's operating instructions.

Simultaneous recording

The signals of the source selected with the function selector button are output simultaneously to the CDR/TAPE and VCR REC OUT jacks. If a total of two tape and/or video decks are connected and set to the recording mode, the same source can be recorded simultaneously on every decks.

NOTES:
- The AUDIO IN's signal selected with the input selector knob are output to the CDR/TAPE and VCR AUDIO OUT jacks.
- The DIGITAL IN's signal selected with the input selector knob are output to the DIGITAL OUT (OPTICAL) jack.

13 SURROUND

Before playing with the surround function

- Before playing with the surround function, be sure to use the test tones to adjust the playback level from each speakers. This adjustment can be performed from the remote control unit, as (described) below.
- The adjustment with the test tones is only effective in the DOLBY/DTS SURROUND modes.
  The adjusted playback levels for the different surround modes are automatically stored in the memory of each surround modes.

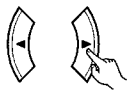
1 Set the DOLBY/DTS SURROUND (Dolby Pro Logic II or Dolby Digital or DTS) modes.

(Main unit) (Remote control unit)

2 Press the TEST TONE button.

(Remote control unit)

3 Test tones are output from the different speakers. Use the channel volume adjust buttons to adjust so that the volume of the test tones is the same for all the speakers.

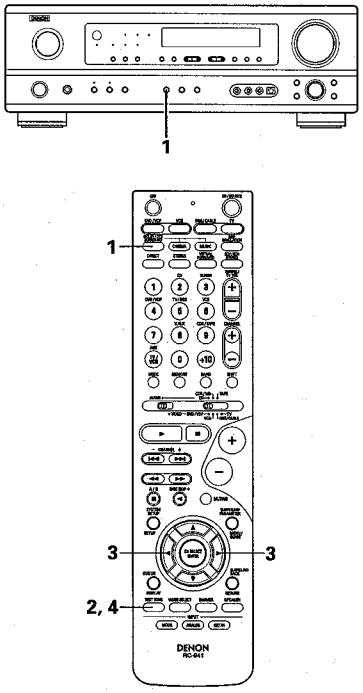


(Remote control unit)

NOTE:
- Please make sure the "AUDIO" position of the slide switch on the remote control unit.

4 After completing the adjustment, press the TEST TONE button again.

(Remote control unit)



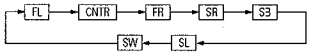
• After adjusting using the test tones, adjust the channel levels either according to the playback sources or to suit your tastes, as (described) below.

1 Select the speaker whose level you want to adjust.

(Remote control unit)

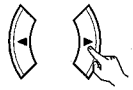
2 The channel switches as shown below each time the button is pressed.

(Remote control unit)



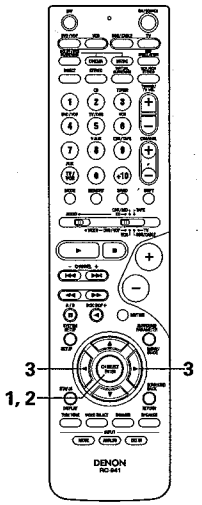
NOTE:
• Please make sure the "AUDIO" position of the slide switch on the remote control unit.

3 Adjust the level of the selected speaker.



(Remote control unit)

※ Default setting of channel level is 0 dB.
※ The level of the selected speaker can be adjusted within the range of +12 to –12 dB using cursor buttons.
※ SW channel level can be turned off by decreasing one step from –12 dB.
OFF ↔ –12 dB ↔ 12 dB



Dolby Surround Pro Logic II mode

1 Select the function to which the component you want to play is connected.

Example: DVD

(Main unit)

(Remote control unit)

2 Select the Dolby Surround Pro Logic II mode.

(Main unit)

(Remote control unit)

• The Dolby Pro Logic II indicator lights.

Display

DOLBY PLII cine

Light

PRO LOGIC II

PLII C DVD

3 Play a program source with the DOLBY SURROUND mark.
• For operating instructions, refer to the manuals of the respective components.

4 Select the surround parameter mode.

Display

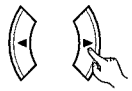
MODE cinema

(Main unit) (Remote control unit)

※ To perform this operation from the remote control unit, check that the mode selector switch is set to "AUDIO".

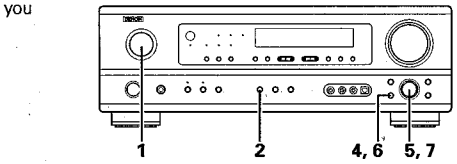
5 Select the optimum mode for the source.

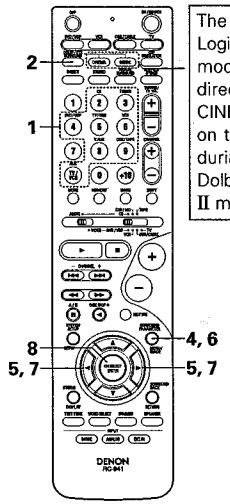
(Main unit)



(Remote control unit)

MODE DOLBY PL | MODE cinema | MODE music





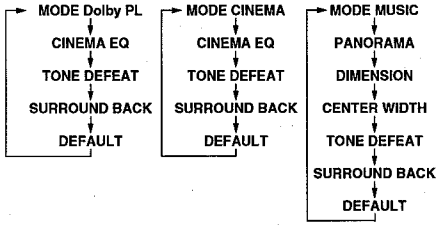
The Dolby Surround Pro Logic II Cinema or Music mode can be chosen directly by pressing the CINEMA or MUSIC button on the remote control unit during playback in the Dolby Surround Pro Logic II mode.

6

Set the surround parameters according to the mode.

(Main unit) (Remote control unit)

- The mode switches as shown below each time the button is pressed.

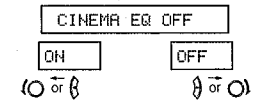


※ If you do want the bass and trable to be adjusted, turn off the tone defeat mode.

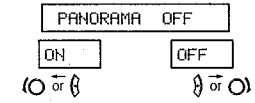
7

Set the various surround parameters.

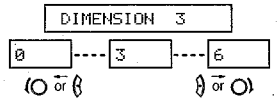
- **CINEMA EQ setting**



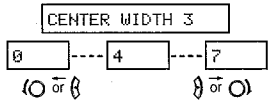
- **PANORAMA setting**



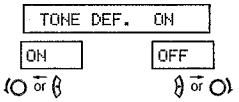
- **DIMENSION setting**



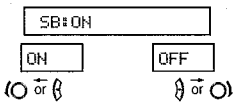
- **CENTER WIDTH setting**



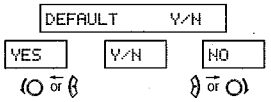
- **TONE DEFEAT setting**



- **SURROUND BACK SPEAKER setting**



- **DEFAULT setting**



※ Select "Yes" to reset to the factory defaults.

8

Press the ENTER button to finish surround parameter mode.

(Remote control unit)

NOTE:
- When making parameter settings, the display will return to the regular condition several seconds after the last button was pressed and the setting will be completed.

DTS NEO:6 mode

1

Select the function to which the component you want to play is connected.

Example: DVD

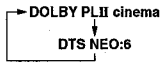
(Main unit) (Remote control unit)

2

Select the DTS NEO:6 mode.

(Main unit) (Remote control unit)

- The mode switches as shown below each time the button is pressed.

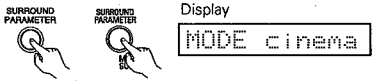


3

Play a program source.

4

Select the surround parameter mode.

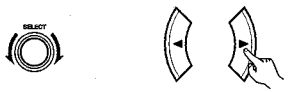


(Main unit) (Remote control unit)

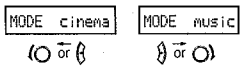
※ To perform this operation from the remote control unit, check that the mode selector switch is set to "AUDIO".

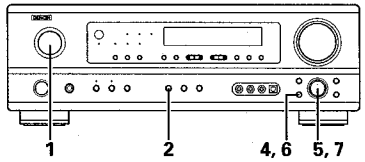
5

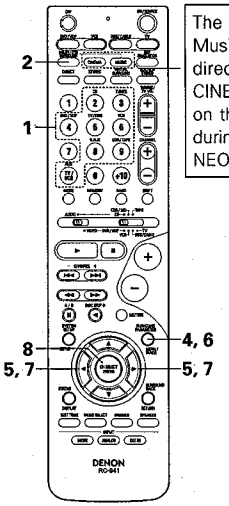
Select the optimum mode for the source.



(Main unit) (Remote control unit)





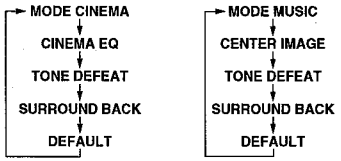


The DTS NEO:6 Cinema or Music mode can be chosen directly by pressing the CINEMA or MUSIC button on the remote control unit during playback in the DTS NEO:6 mode.

6 Set the surround parameters according to the mode.

(Main unit) (Remote control unit)

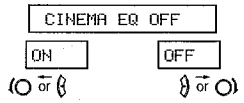
- The mode switches as shown below each time the button is pressed.



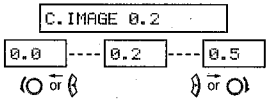
※ If you do want the bass and trable to be adjusted, turn off the tone defeat mode.

7 Set the various surround parameters.

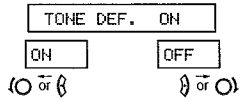
- **CINEMA EQ setting**



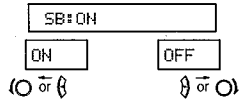
- **CENTER IMAGE setting**



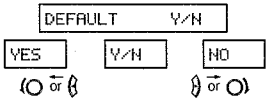
- **TONE DEFEAT setting**



- **SURROUND BACK SPEAKER setting**



- **DEFAULT setting**



※ Select "Yes" to reset to the factory defaults.

8 Press the ENTER button to finish surround parameter mode.

(Remote control unit)

Surround parameters ①

Pro Logic II Mode:

- The Cinema mode is for use with stereo television shows and all programs encoded Dolby Surround.
- The Music mode is recommended as the standard mode for autosound music systems (no video), and is optional for A/V systems.
- The Pro Logic mode offers the same robust surround processing as original Pro Logic in case the source contents is not of optimum quality.

Select one of the modes ("cinema", "music" or "Pro Logic").

Panorama Control:

This mode extends the front stereo image to include the surround speakers for an exciting "wraparound" effect with side wall imaging.
Select "OFF" or "ON".

Dimension Control:

This control gradually adjust the soundfield either towards the front or towards the rear.
The control can be set in 7 steps from 0 to 6.

Center Width Control:

This control adjust the center image so it may be heard only from the center speaker; only from the left/right speakers as a phantom image; or from all three front speakers to varying degrees.
The control can be set in 8 steps from 0 to 7.

DTS NEO:6 Mode:

- **Cinema**

This mode is optimum for playing movies. Decoding is performed with emphasis on separation performance to achieve the same atmosphere with 2-channel sources as with 6.1-channel sources.
This mode is effective for playing sources recorded in conventional surround formats as well, because the in-phase component is assigned mainly to the center channel (C) and the reversed phase component to the surround (SL, SR and SB channels).

- **Music**

This mode is suited mainly for playing music. The front channel (FL and FR) signals bypass the decoder and are played directly so there is no loss of sound quality, and the effect of the surround signals output from the center (C) and surround (SL, SR and SB) channels add a natural sense of expansion to the sound field.

CENTER IMAGE (0.0 to 0.5: default 0.2)**:**

The center image parameter for adjusting the expansion of the center channel in the DTS NEO:6 MUSIC mode has been added.

Dolby Digital mode (only with digital input) and DTS Surround (only with digital input)

1 Select the input source.

Playback with a digital input

① Select an input source set to digital (COAXIAL/OPTICAL) (see page 14).

Example: DVD

(Main unit)

(Remote control unit)

② Set the input mode to "AUTO" or DTS.

(Main unit)

(Remote control unit)

2 Select the Dolby/DTS Surround mode.

(Main unit)

(Remote control unit)

3 Play a program source with the DOLBY DIGITAL, dts mark.

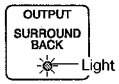
• The Dolby Digital indicator lights when playing Dolby Digital sources.

• The DTS indicator lights when playing DTS sources.

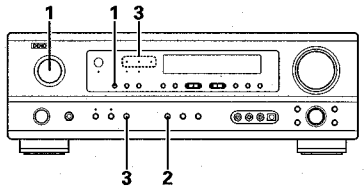
Operate the SURROUND BACK button to switch Surround Back CH ON/OFF.

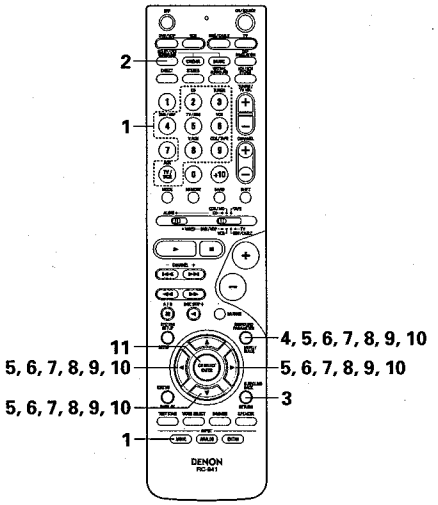
(Main unit)

(Remote control unit)



• Lights when the Surround Back CH is on.



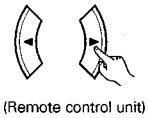


4 Set the surround parameter according to the source.
First, press the SURROUND PARAMETER button.

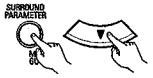
(Main unit)

NOTE:
• Please make sure the "AUDIO" position of the slide switch on the remote control unit.

5

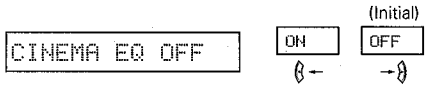


(Remote control unit)



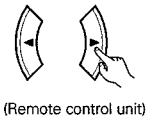
(Remote control unit)

Use the ◁ (left) and ▷ (right) buttons to set the CINEMA EQ.



Press the SURROUND PARAMETER or ▽ (down) button to switch to the D. COMP. setting.

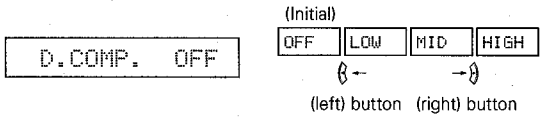
6



(Remote control unit)

(Remote control unit)

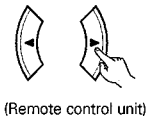
Use the ◁ (left) and ▷ (right) buttons to set the D. COMP.



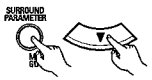
Press the SURROUND PARAMETER or ▽ (down) button to switch to the LFE setting.

NOTE:
• This parameter is not displayed during DTS playback.

7

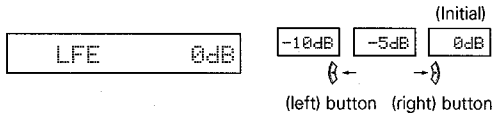


(Remote control unit)



(Remote control unit)

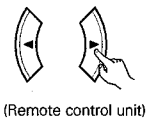
Use the ◁ (left) and ▷ (right) buttons to set the LFE level.



• The level can be adjusted in units of 1 dB from –10 to 0 dB.
Set to the desired level according to the speaker systems being used and the source to be played.

Press the SURROUND PARAMETER or ▽ (down) button to switch to the TONE DEFEAT setting.

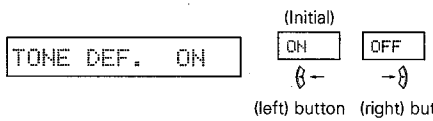
8



(Remote control unit)

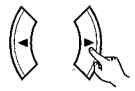
(Remote control unit)

Use the ◁ (left) and ▷ (right) buttons to set the TONE DEFEAT.



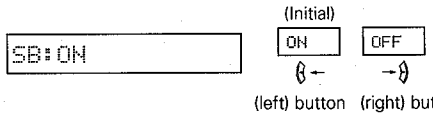
Press the SURROUND PARAMETER or ▽ (down) button to switch to the SURROUND BACK SPEAKER setting.

9



(Remote control unit)

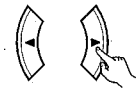
Use the ◀ (left) and ▶ (right) buttons to set the SURROUND BACK SPEAKER.



(Remote control unit)

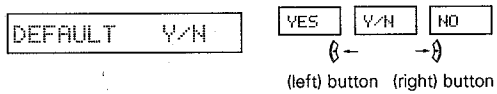
Press the SURROUND PARAMETER or ▽ (down) button to switch to the default setting.

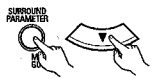
10



(Remote control unit)

To reset the settings to the factory defaults, use the ◀ (left) and ▶ (right) buttons to display "Yes".





(Remote control unit)

Press the SURROUND PARAMETER or ▽ (down) button to switch to the CINEMA EQ. setting.

11

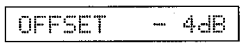
(Remote control unit)

Press the ENTER button to finish surround parameter mode.

■ Dialogue Normalization

The dialogue normalization function is activated automatically when playing Dolby Digital program sources.
Dialogue normalization is a basic function of Dolby Digital which automatically normalizes the dialog level (standard level) of the signals which are recorded at different levels for different program sources, such as DVD, DTV and other future formats that will use Dolby Digital.
These contents can be verified with the STATUS button.

Display



The number indicates the normalization level when the currently playing program is normalized to the standard level.

Surround parameters ②

CINEMA EQ. (Cinema Equalizer):
The Cinema EQ function gently decreases the level of the extreme high frequencies, compensating for overly-bright sounding motion picture soundtracks. Select this function if the sound from the front speakers is too bright.
This function only works in the Dolby Pro Logic II, Dolby Digital and DTS Surround modes. (The same contents are set for all operating modes.)

D.COMP. (Dynamic Range Compression):
Motion picture soundtracks have tremendous dynamic range (the contrast between very soft and very loud sounds). For listening late at night, or whenever the maximum sound level is lower than usual, the Dynamic Range Compression allows you to hear all of the sounds in the soundtrack (but with reduced dynamic range). (This only works when playing program sources recorded in Dolby Digital.) Select one of the four parameters ("OFF", "LOW", "MID" (middle) or "HI" (high)). Set to OFF for normal listening.

LFE (Low Frequency Effect):
This sets the level of the LFE (Low Frequency Effect) sounds included in the source when playing program sources recorded in Dolby Digital or DTS.
If the sound produced from the subwoofer sounds distorted due to the LFE signals when playing Dolby Digital or DTS sources when the peak limiter is turned off with the subwoofer peak limit level setting (system setup menu), adjust the level as necessary.
Program source and adjustment range:
1. Dolby Digital: –10 dB to 0 dB
2. DTS Surround: –10 dB to 0 dB

※ When DTS encoded <u>movie</u> software is played, it is recommended that the LFE LEVEL be set to 0 dB for correct DTS playback.
※ When DTS encoded <u>music</u> software is played, it is recommended that the LFE LEVEL be set to –10 dB for correct DTS playback.

SB CH OUT (Surround Back):
"OFF" .....Playback is conducted without using the surround back speaker.
"ON".....Playback is conducted using the surround back speaker.

NOTE: This operation can be performed directly using the SURROUND BACK button.

14 DSP SURROUND SIMULATION

• This unit is equipped with a high performance DSP (Digital Signal Processor) which uses digital signal processing to synthetically recreate the sound field. One of 7 preset surround modes can be selected according to the program source and the parameters can be adjusted according to the conditions in the listening room to achieve a more realistic, powerful sound. These surround modes can also be used for program sources not recorded in Dolby Surround Pro Logic or Dolby Digital.

Surround modes and their features

1	5CH/6CH STEREO	In this mode, the signals of the front left channel are output from the left surround channel, the signals of the front right channel are output from the right surround channel, and the same (in-phase) component of the left and right channels is output from the center channel. This mode provides all speaker surround sound, but without directional steering effects, and works with any stereo program source.
2	MONO MOVIE (NOTE 1)	Select this when watching monaural movies for a greater sense of expansion.
3	ROCK ARENA	Use this mode to achieve the feeling of a live concert in an arena with reflected sounds coming from all directions.
4	JAZZ CLUB	This mode creates the sound field of a live house with a low ceiling and hard walls. This mode gives jazz a very vivid realism.
5	VIDEO GAME	Use this to enjoy video game sources.
6	MATRIX	Select this to emphasize the sense of expansion for music sources recorded in stereo. Signals consisting of the difference component of the input signals (the component that provides the sense of expansion) processed for delay are output from the surround channel.
7	VIRTUAL	Select this mode to enjoy a virtual sound field, produced from the front 2-channel speakers.

※ Depending on the program source being played, the effect may not be very noticeable.
In this case, try other surround modes, without worrying about their names, to create a sound field suited to your tastes.

NOTE 1: When playing sources recorded in monaural, the sound will be one-sided if signals are only input to one channel (left or right), so input signals to both channels. If you have a source component with only one audio output (monophonic camcorder, etc.) obtain a "Y" adaptor cable to split the mono output to two outputs, and connect to the L and R inputs.

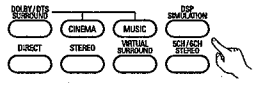
NOTE:
DIRECT, STEREO and 5CH/6CH STEREO mode can be used when playing PCM signals with a sampling frequency of 96 kHz (such as from DVD-Video discs that contain 24 bit, 96 kHz audio). If such signals are input during playback in the other surround modes, the mode automatically switches to STEREO.

Personal Memory Plus
This set is equipped with a personal memorize function that automatically memorizes the surround modes and input modes selected for the input different sources. When the input source is switched, the modes set for that source last time it was used are automatically recalled.
※ The surround parameters, tone control settings and playback level balance for the different output channels are memorized for each surround mode.

DSP surround simulation

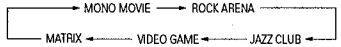
• To operate the surround mode and surround parameters from the remote control unit.

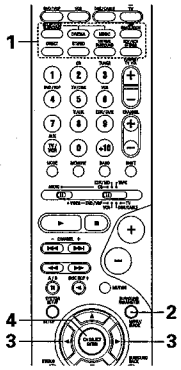
1 Select the surround mode for the input channel.



(Remote control unit)

The surround mode switches in the following order each time the DSP SIMULATION button is pressed:

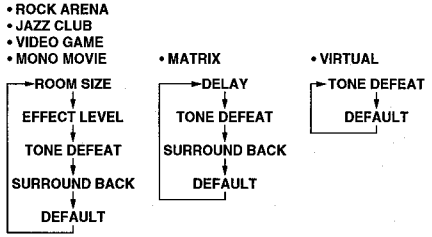




2

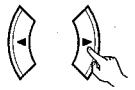
(Remote control unit)

To enter the surround parameter setting mode, press the SURROUND PARAMETER button.
• The surround parameter switches in the following order each time the SURROUND PARAMETER button is pressed for the different surround modes.



※ If you do want the bass and trable to be adjusted, turn off the tone defeat mode.

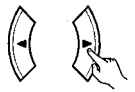
3



(Remote control unit)

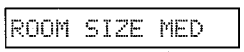
Display the parameter you want to adjust, then use the ◀ (left) and ▶ (right) buttons to set it.

(1) ROOM SIZE



(Remote control unit)

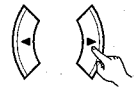
Use the ◀ (left) and ▶ (right) buttons to set the room size.



(Initial)

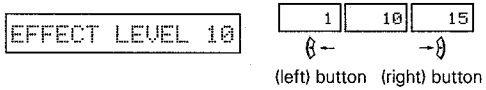
(left) button (right) button

(2) EFFECT LEVEL

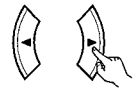


(Remote control unit)

Use the ◀ (left) and ▶ (right) buttons to set the effect level.

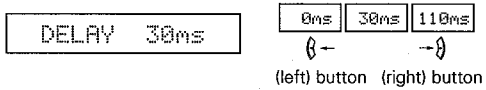


(3) DELAY TIME

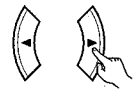


(Remote control unit)

Use the ◀ (left) and ▶ (right) buttons to set the delay time.

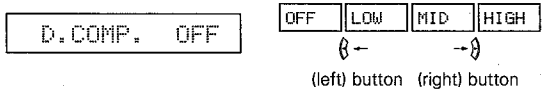


(4) D. COMP.



(Remote control unit)

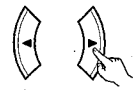
Use the ◀ (left) and ▶ (right) buttons to set the D. COMP.



NOTE:

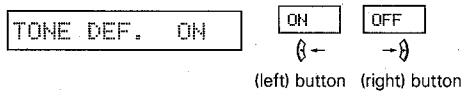
- This parameter is displayed during DOLBY DIGITAL playback.

(5) TONE DEFEAT

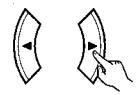


(Remote control unit)

Use the ◀ (left) and ▶ (right) buttons to set the TONE DEFEAT.

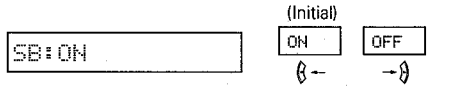


(6) SURROUND BACK SPEAKER

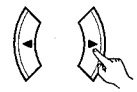


(Remote control unit)

Use the ◀ (left) and ▶ (right) buttons to set the SURROUND BACK SPEAKER.

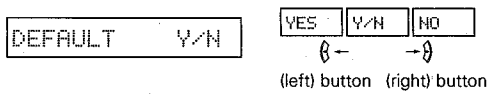


(7) DEFAULT



(Remote control unit)

To reset the settings to the factory defaults, use the ◀ (left) and ▶ (right) buttons to display "Yes".



4

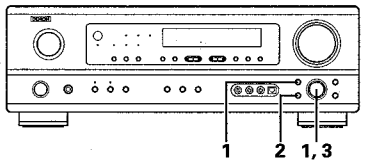
(Remote control unit)

Press the ENTER button to finish surround parameter mode.

- Operating the surround mode and surround parameters from the main unit's panel.

1 Turn the SELECT knob to select the surround mode.

(Main unit)



- When turned clockwise

DIRECT → STEREO → DOLBY PRO LOGIC II → DTS NEO:6 → 5CH/6CH STEREO → MONO MOVIE → ROCK ARENA → JAZZ CLUB → VIDEO GAME → MATRIX → VIRTUAL SURROUND → DIRECT

- When turned counterclockwise

DIRECT → VIRTUAL SURROUND → MATRIX → VIDEO GAME → JAZZ CLUB → ROCK ARENA → MONO MOVIE → 5CH/6CH STEREO → DTS NEO:6 → DOLBY PRO LOGIC II → STEREO → DIRECT

(Main unit)

※ To select the surround mode while adjusting the surround parameters, tone defeat or tone control, press the SURROUND MODE button then operate the selector.

2

(Main unit)

Press the SURROUND PARAMETER button.
Press and hold in the surround parameter button to select the parameter you want to set.

- The parameters which can be set differ for the different surround modes. (Refer to "Surround Modes and Parameters" on page 28.

3 Display the parameter you want to adjust, then turn the SELECT knob to set it.

NOTES:

- When playing PCM digital signals or analog signals in the 5CH/6CH STEREO, ROCK ARENA, JAZZ CLUB, VIDEO GAME, MONO MOVIE or MATRIX surround modes and the input signal switches to a digital signal encoded in Dolby Digital, the Dolby surround mode switches automatically. When the input signal switches to a DTS signal, the mode automatically switches to DTS surround.
- When the "5CH/6CH STEREO" mode is selected, the display differs according to the Surround Back CH ON/OFF.
  Surround Back CH ON: 6CH STEREO
  Surround Back CH OFF: 5CH STEREO

Surround parameters ③

ROOM SIZE:
This sets the size of the sound field.
There are five settings: "small", "med.s" (medium-small), "medium", "med.l" (medium-large) and "large".
"small" recreates a small sound field, "large" a large sound field.

EFFECT LEVEL:
This sets the strength of the surround effect.
The level can be set in 15 steps from 1 to 15. Lower the level if the sound seems distorted.

DELAY TIME:
In the matrix mode only, the delay time can be set within the range of 0 to 110 ms.

■ Surround modes and parameters

Mode	Channel output					When playing Dolby Digital signals	When playing DTS signals	When playing PCM signals (96k)	When playing ANALOG signals
	FRONT L/R	CENTER	SURROUND L/R	SURROUND BACK	SUB-WOOFER				
DIRECT	○	×	×	×	◎	○	○	○ (○)	○
STEREO	○	×	×	×	◎	○	○	○ (○)	○
EXTERNAL INPUT	○	◎	◎	◎	◎	×	×	×	○
DOLBY PRO LOGIC II	○	◎	◎	◎	◎	○ *	×	○	○
DTS NEO:6	○	◎	◎	◎	◎	×	○	○	○
DOLBY DIGITAL	○	◎	◎	◎	◎	○	×	×	×
DTS SURROUND	○	◎	◎	◎	◎	×	○	×	×
5CH/6CH STEREO	○	◎	◎	◎	◎	×	×	○ (○)	○
ROCK ARENA	○	◎	◎	◎	◎	×	×	○	○
JAZZ CLUB	○	◎	◎	◎	◎	×	×	○	○
VIDEO GAME	○	◎	◎	◎	◎	×	×	○	○
MONO MOVIE	○	◎	◎	◎	◎	×	×	○	○
MATRIX	○	◎	◎	◎	◎	×	×	○	○
VIRTUAL	○	×	×	×	◎	○	○	○	○

* Only for 2 ch contents.

○ : Signal
× : No signal
◎ : Turned on or off by speaker configuration setting

○ : Able
× : Unable

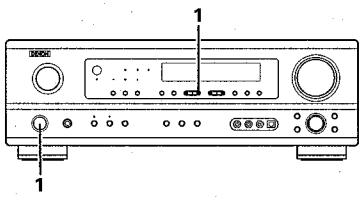
Mode	Parameter (default values are shown in parentheses)													
		SURROUND PARAMETER					PRO LOGIC II MUSIC MODE ONLY			NEO:6 MUSIC MODE ONLY		Dolby Digital signals		DTS signals
	TONE CONTROL	ROOM SIZE	EFFECT LEVEL	DELAY TIME	SW ATT.	MODE	PANORAMA	DIMENSION	CENTER WIDTH	CENTER IMAGE	CINEMA EQ	D.COMP.	LFE	LFE
DIRECT	×	×	×	×	×	×	×	×	×	×	×	○ (OFF)	○ (0dB)	○ (0dB)
STEREO	○ (0dB)	×	×	×	×	×	×	×	×	×	×	○ (OFF)	○ (0dB)	○ (0dB)
EXTERNAL INPUT	○ (0dB)	×	×	×	○ (OFF)	×	×	×	×	×	×	×	×	×
DOLBY PRO LOGIC II	○ (0dB)	×	×	×	×	○ (CINEMA)	○ (OFF)	○ (3)	○ (3)	×	○ (OFF)	○ (OFF)	○ (0dB)	–
DTS NEO:6	○ (0dB)	×	×	×	×	○ (CINEMA)	–	–	–	○ (0.2)	○ (OFF)	–	–	○ (0dB)
DOLBY DIGITAL	○ (0dB)	×	×	×	×	×	×	×	×	×	○ (OFF)	○ (OFF)	○ (0dB)	–
DTS SURROUND	○ (0dB)	×	×	×	×	×	×	×	×	×	○ (OFF)	×	–	○ (0dB)
5CH/6CH STEREO	○ (0dB)	×	×	×	×	×	×	×	×	×	×	×	×	×
ROCK ARENA	○ (0dB)	○ (Medium)	○ (10)	×	×	×	×	×	×	×	×	×	×	×
JAZZ CLUB	○ (0dB)	○ (Medium)	○ (10)	×	×	×	×	×	×	×	×	×	×	×
VIDEO GAME	○ (0dB)	○ (Medium)	○ (10)	×	×	×	×	×	×	×	×	×	×	×
MONO MOVIE	○ (0dB)	○ (Medium)	○ (10)	×	×	×	×	×	×	×	×	×	×	×
MATRIX	○ (0dB)	×	×	○ (30msec)	×	×	×	×	×	×	×	×	×	×
VIRTUAL	○ (0dB)	×	×	×	×	×	×	×	×	×	×	○ (OFF)	×	×

○ : Adjustable
× : Not adjustable

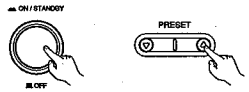
15 LISTENING TO THE RADIO

Auto preset memory

This unit is equipped with a function for automatically searching for FM broadcast stations and storing them in the preset memory.



1 When the main unit's power operation switch turn on while pressing the set's PRESET △ button the unit automatically begins searching for FM broadcast stations.



(Main unit)

2 When the first FM broadcast station is found, that station is stored in the preset memory at channel A1. Subsequent stations are automatically stored in order at preset channels A2 to A8, B1 to B8, C1 to C8, D1 to D8 and E1 to E8, for a maximum of 40 stations.

3 Channel A1 is tuned in after the auto preset memory operation is completed.

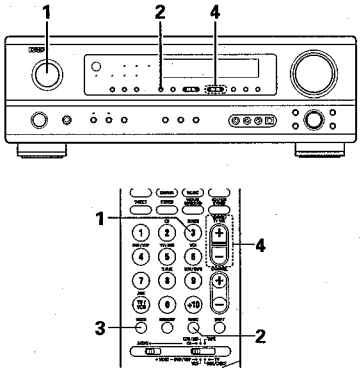
NOTES:

- If an FM station cannot be preset automatically due to poor reception, use the "Manual tuning" operation to tune in the station, then preset it using the manual "Preset memory" operation.
- To interrupt this function, press the power operation switch.

■ DEFAULT VALUE

AUTO TUNER PRESETS	
A1 ~ A8	87.5/89.1/98.1/108/90.1/90.1/90.1/90.1 MHz
B1 ~ B8	522/603/999/1404/1611 kHz/90.1/90.1/90.1 MHz
C1 ~ C8	90.1 MHz
D1 ~ D8	90.1 MHz
E1 ~ E8	90.1 MHz

Auto tuning



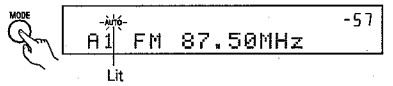
1 Set the input source to "TUNER".

(Main unit) (Remote control unit)

2 Watching the display, press the BAND button to select the desired band (AM or FM).

(Main unit) (Remote control unit)

3 Press the MODE button to set the auto tuning mode.



(Remote control unit)

4 Press the TUNING UP △ (+) or ▽ (–) button.

(Main unit) (Remote control unit)

- Automatic searching begins, then stops when a station is tuned in.

NOTE:

- When in the auto tuning mode on the FM band, the "STEREO" indicator lights on the display when a stereo broadcast is tuned in. At open frequencies, the noise is muted and the "TUNED" and "STEREO" indicators turn off.

Manual tuning

1 Set the input function to "TUNER".

2 Watching the display, press the BAND button to select the desired band (AM or FM).

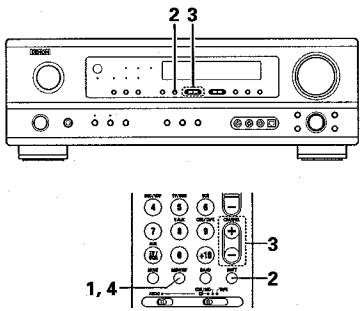
3 Press the MODE button to set the manual tuning mode.
Check that the display's "AUTO" indicator turns off.

4 Press the TUNING △ (+) or ▽ (–) button to tune in the desired station.
The frequency changes continuously when the button is held in.

NOTE:

- When the manual tuning mode is set, FM stereo broadcasts are received in monaural and the "STEREO" indicator turns off.

Preset stations



Preparations:
Use the "Auto tuning" or "Manual tuning" operation to tune in the station to be preset in the memory.

1 Press the MEMORY button.

(Remote control unit)

2 Press the SHIFT button and select the desired memory block (A to E).

(Main unit)

(Remote control unit)

NOTE:
- Please make sure the "AUDIO" position of the slide switch on the remote control unit.

3 Press the PRESET △ (+) or ▽ (–) button to select the desired preset channel (1 to 8).

(Main unit)

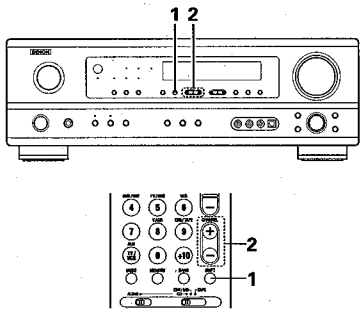
(Remote control unit)

4 Press the MEMORY button again to store the station in the preset memory.

(Remote control unit)

※ To preset other channels, repeat steps 1 to 4.
A total of 40 broadcast stations can be preset – 8 stations (channels 1 to 8) in each of blocks A to E.

Recalling preset stations



1 Watching the display, press the SHIFT button to select the preset memory block.

(Main unit)

(Remote control unit)

NOTE:
- Please make sure the "AUDIO" position of the slide switch on the remote control unit.

2 Watching the display, press the PRESET △ (+) or ▽ (–) button to select the desired preset channel.

(Main unit)

(Remote control unit)

RDS (Radio Data System)

RDS (works only on the FM band) is a broadcasting service which allows station to send additional information along with the regular radio program signal.
The following three types of RDS information can be received on this unit:

■ **Program Type (PTY)**
PTY identifies the type of RDS program.
The program types and their displays are as follows:

NEWS	News	ROCK M	Rock Music	PHONE IN	Phone In
AFFAIRS	Current Affairs	EASY M	Easy Listening Music	TRAVEL	Travel
INFO	Information	LIGHT M	Light Classical	LEISURE	Leisure
SPORT	Sports	CLASSICS	Serious Classical	JAZZ	Jazz Music
EDUCATE	Education	OTHER M	Other Music	COUNTRY	Country Music
DRAMA	Drama	WEATHER	Weather	NATION M	National Music
CULTURE	Culture	FINANCE	Finance	OLDIES	Oldies Music
SCIENCE	Science	CHILDREN	Children's programmes	FOLK M	Folk Music
VARIED	Varied	SOCIAL	Social Affairs	DOCUMENT	Documentary
POP M	Pop Music	RELIGION	Religion		

■ **Traffic Program (TP)**
TP identifies programs that carry traffic announcements.
This allows you to easily find out the latest traffic conditions in your area before you leaving home.

■ **Radio Text (RT)**
RT allows the RDS station to send text messages that appear on the display.

NOTE: The operations described below using the RDS, PTY and RT buttons will not function in areas in which there are no RDS broadcasts.

RDS search

Use this function to automatically tune to FM stations that provide RDS service.

1 Set the input source to "TUNER".

(Main unit)

(Remote control unit)

2 Press the RDS button until "RDS SEARCH" appears on the display.

(Main unit)

3 Press the PRESET △ (+) or ▽ (–) button to automatically begin the RDS search operation.

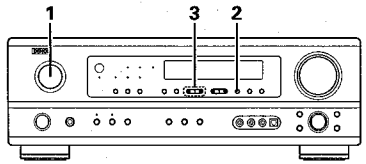
(Main unit)

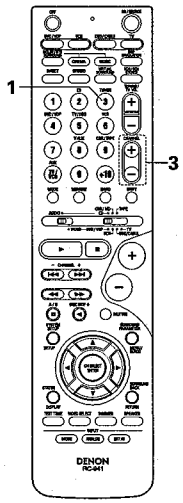
(Remote control unit)

If no RDS stations is found with above operation, all the reception band are searched.

4 When a broadcast station is found, that station's name appears on the display.

5 To continue searching, repeat step 3.
If no other RDS station is found when all the frequencies are searched, "NO RDS" is displayed.





PTY search

Use this function to find RDS stations broadcasting a designated program type (PTY).
For a description of each program type, refer to "Program Type (PTY)".

1 Set the input source to "TUNER".

(Main unit)

(Remote control unit)

2 Press the RDS button until "PTY SEARCH" appears on the display.

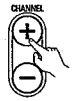
(Main unit)

3 Watching the display, press the PTY button to call out the desired program type.

(Main unit)

4 Press the PRESET △ (+) or ▽ (–) button to automatically begin the PTY search operation.

(Main unit)

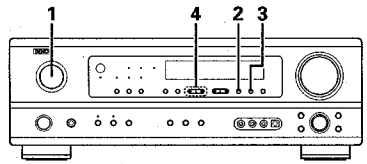


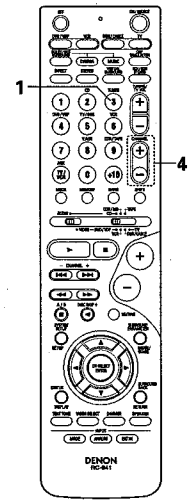
(Remote control unit)

If there is no station broadcasting the designated program type with above operation, all the reception bands are searched.

5 The station name is displayed on the display after searching stops.

6 To continue searching, repeat step 4.
If no other station broadcasting the designated program type is found when all the frequencies are searched, "NO PROGRAMME" is displayed.





TP search

Use this function to find RDS stations broadcasting traffic program (TP stations).

1 Set the input source to "TUNER".

(Main unit) (Remote control unit)

2 Press the RDS button until "TP SEARCH" appears on the display.

(Main unit)

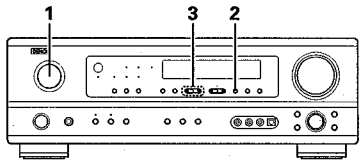
3 Press the PRESET △ (+) or ▽ (–) button TP search begins.

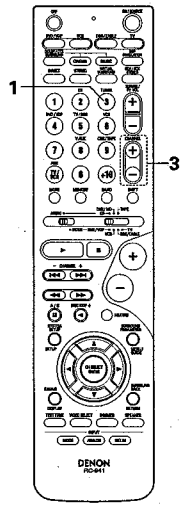
(Main unit) (Remote control unit)

If no TP station is found with above operation, all the reception bands are searched.

4 The station name is displayed on the display after searching stops.

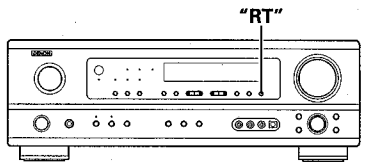
5 To continue searching, repeat step 3.
If no other TP station is found when all the frequencies are searched, "NO PROGRAMME" is displayed.





RT (Radio Text)

"RT" appears on the display when radio text data is received.
When the RT button is pressed while receiving an RDS broadcast station, the text data broadcast from the station is displayed. To turn the display off, press the RT button again. If no text data is being broadcast, "NO TEXT DATA" is displayed.



16 LAST FUNCTION MEMORY

- This unit is equipped with a last function memory which stores the input and output setting conditions as they were immediately before the power is switched off.
- The unit is also equipped with a back-up memory. This function provides approximately one week of memory storage when the main unit's power switch is off and with the power supply cord disconnected.

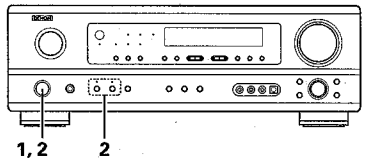
17 INITIALIZATION OF THE MICROPROCESSOR

When the indication of the display is not normal or when the operation of the unit does not shows the reasonable result, the initialization of the microprocessor is required by the following procedure.

1 Switch off the unit using the main unit's power operation switch.

2 Hold the following SPEAKER A button and B button, and turn the main unit's power operation switch on.

3 Check that the entire display is flashing with an interval of about 1 second, and release your fingers from the 2 buttons and the microprocessor will be initialized.



NOTES:
- If step 3 does not work, start over from step 1.
- If the microprocessor has been reset, all the button settings are reset to the default values (the values set upon shipment from the factory).

Turning on the main unit's power from the standby mode without using the remote control unit
- Press the power switch on the main unit while pressing the INPUT MODE button on the main unit's panel to turn on the power.

18 ADDITIONAL INFORMATION

Optimum surround sound for different sources

There are currently various types of multi-channel signals (signals or formats with more than two channels).

■ Types of multi-channel signals

Dolby Digital, Dolby Pro Logic, DTS, high definition 3-1 signals (Japan MUSE Hi-Vision audio), DVD-Audio, SACD (Super Audio CD), MPEG multi-channel audio, etc.

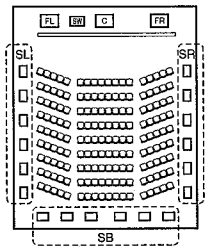
"Source" here does not refer to the type of signal (format) but the recorded content. Sources can be divided into two major categories.

■ Types of sources

• Movie audio

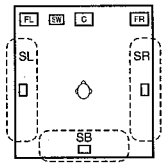
Signals created to be played in movie theaters. In general sound is recorded to be played in movie theaters equipped with multiple surround speakers, regardless of the format (Dolby Digital, DTS, etc.).

Movie theater sound field



Multiple surround speakers
(For 6.1-channel system)

Listening room sound field

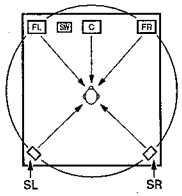


In this case it is important to achieve the same sense of expansion as in a movie theater with the surround channels.
To do so, in some cases the number of surround speakers is increased (to four or eight) or speakers with bipolar or dipolar properties are used.

SL: Surround L channel
SR: Surround R channel
SB: Surround back channel

• Other types of audio

These signals are designed to recreate a 360° sound field using three to five speakers.



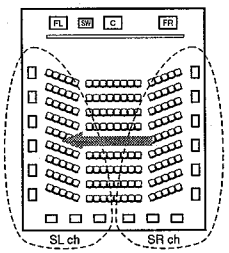
In this case the speakers should surround the listener from all sides to create a uniform sound field from 360°. Ideally the surround speakers should function as "point" sound sources in the same way as the front speakers.

These two types of sources thus have different properties, and different speaker settings, particularly for the surround speakers, are required in order to achieve the ideal sound.

Surround back speakers

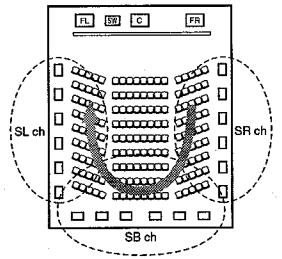
A 6.1-channel system is a conventional 5.1-channel system to which the "surround back" (SB) channel has been added. This makes it easy to achieve sound positioned directly behind the listener, something that was previously difficult with sources designed for conventional multi surround speakers. In addition, the acoustic image extending between the sides and the rear is narrowed, thus greatly improving the expression of the surround signals for sounds moving from the sides to the back and from the front to the point directly behind the listening position.

Change of positioning and acoustic image with 5.1-channel systems



Movement of acoustic image from SR to SL

Change of positioning and acoustic image with 6.1-channel systems



Movement of acoustic image from SR to SB to SL

With this set, speaker(s) for 1 or 2 channels are required to achieve a 6.1-channel system (DTS-ES, etc.). Adding these speakers, however, increases the surround effect not only with sources recorded in 6.1 channels but also with conventional 2- to 5.1-channel sources. All the Denon original surround modes (see page 32) are compatible with 6.1-channel playback, so you can enjoy 6.1-channel sound with any signal source.

■ Placement of the surround left and right channels when using surround back speakers

Using surround back speakers greatly improves the positioning of the sound at the rear. Because of this, the surround left and right channels play an important role in achieving a smooth transition of the acoustic image from the front to the back. As shown on the diagram above, in a movie theater the surround signals are also produced from diagonally in front of the listeners, creating an acoustic image as if the sound were floating in space.

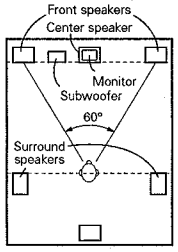
To achieve these effects, we recommend placing the speakers for the surround left and right channels slightly more towards the front than with conventional surround systems. Doing so sometimes increases the surround effect when playing conventional 5.1-channel sources in the 6.1 surround or DTS-ES Matrix 6.1 mode. Check the surround effects of the various modes before selecting the surround mode.

Speaker setting examples

Here we describe a number of speaker settings for different purposes. Use these examples as guides to set up your system according to the type of speakers used and the main usage purpose.

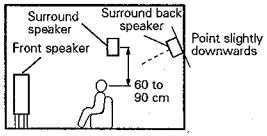
1. DTS-ES compatible system (using surround back speakers)

(1) Basic setting for primarily watching movies



Surround back speakers (1 spkr)

As seen from above



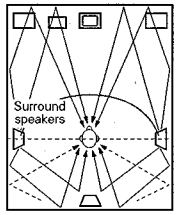
As seen from the side

- Set the front speakers with their front surfaces as flush with the TV or monitor screen as possible. Set the center speaker between the front left and right speakers and no further from the listening position than the front speakers.
- Consult the owner's manual for your subwoofer for advice on placing the subwoofer within the listening room.
- If the surround speakers are direct-radiating (monopolar) then place them slightly behind and at an angle to the listening position and parallel to the walls at a position 60 to 90 cm above ear level at the prime listening position.
- When using one surround back speaker, place it at the rear center facing the front at a slightly higher position (0 to 20 cm) than the surround speakers.
- We recommend installing the surround back speaker(s) at a slightly downward facing angle. This effectively prevents the surround back channel signals from reflecting off the monitor or screen at the front center, resulting in interference and making the sense of movement from the front to the back less sharp.

(2) Setting for primarily watching movies using diffusion type speakers for the surround speakers

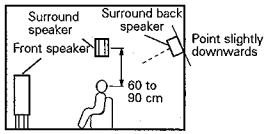
For the greatest sense of surround sound envelopment, diffuse radiation speakers such as bipolar types, or dipolar types, provide a wider dispersion than is possible to obtain from a direct radiating speaker (monopolar). Place these speakers at either side of the prime listening position, mounted above ear level.

Path of the surround sound from the speakers to the listening position



Surround back speakers (1 spkr)

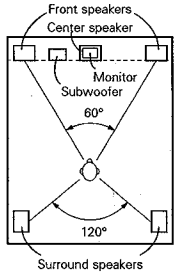
As seen from above



As seen from the side

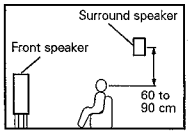
- Set the front speakers, center speaker and subwoofer in the same positions as in example (1).
- It is best to place the surround speakers directly at the side or slightly to the front of the viewing position, and 60 to 90 cm above the ears.
- Same as surround back speaker installation method (1).
  Using dipolar speakers for the surround back speakers as well is more effective.
- Connect the surround speakers to the surround speaker jacks.
- The signals from the surround channels reflect off the walls as shown on the diagram at the left, creating an enveloping and realistic surround sound presentation.
  For multi-channel music sources however, the use of bipolar or dipolar speakers mounted at the sides of the listening position may not be satisfactory in order to create a coherent 360 degree surround sound field. Connect another pair of direct radiating speakers as described in example (3) and place them at the rear corners of the room facing towards the prime listening position.

2. When not using surround back speakers



As seen from above

- Set the front speakers with their front surfaces as flush with the TV or monitor screen as possible. Set the center speaker between the front left and right speakers and no further from the listening position than the front speakers.
- Consult the owner's manual for your subwoofer for advice on placing the subwoofer within the listening room.
- If the surround speakers are direct-radiating (monopolar) then place them slightly behind and at an angle to the listening position and parallel to the walls at a position 60 to 90 cm above ear level at the prime listening position.



As seen from the side

Surround

The AVR-1604 is equipped with a digital signal processing circuit that lets you play program sources in the surround mode to achieve the same sense of presence as in a movie theater.

Dolby Surround

(1) Dolby Digital

Dolby Digital is the multi-channel digital signal format developed by Dolby Laboratories.
Dolby Digital consists of up to "5.1" channels - front left, front right, center, surround left, surround right, and an additional channel exclusively reserved for additional deep bass sound effects (the Low Frequency Effects – LFE – channel, also called the ".1" channel, containing bass frequencies of up to 120 Hz).
Unlike the analog Dolby Pro Logic format, Dolby Digital's main channels can all contain full range sound information, from the lowest bass, up to the highest frequencies – 22 kHz. The signals within each channel are distinct from the others, allowing pinpoint sound imaging, and Dolby Digital offers tremendous dynamic range from the most powerful sound effects to the quietest, softest sounds, free from noise and distortion.

■ Dolby Digital and Dolby Pro Logic

Comparison of home surround systems	Dolby Digital	Dolby Pro Logic
No. recorded channels (elements)	5.1 ch	2 ch
No. playback channels	5.1 ch	4 ch
Playback channels (max.)	L, R, C, SL, SR, SW	L, R, C, S (SW - recommended)
Audio processing	Digital discrete processing Dolby Digital encoding/decoding	Analog matrix processing Dolby Surround
High frequency playback limit of surround channel	20 kHz	7 kHz

■ **Dolby Digital compatible media and playback methods**

Marks indicating Dolby Digital compatibility: DOLBY DIGITAL.

The following are general examples. Also refer to the player's operating instructions.

Media	Dolby Digital output jacks	Playback method (reference page)
LD (VDP)	Coaxial Dolby Digital RF output jack ※1	Set the input mode to "AUTO". (Page 18)
DVD	Optical or coaxial digital output (same as for PCM) ※2	Set the input mode to "AUTO". (Page 18)
Others (satellite broadcasts, CATV, etc.)	Optical or coaxial digital output (same as for PCM)	Set the input mode to "AUTO". (Page 18)

※1 Please use a commercially available adapter when connecting the Dolby Digital RF output jack of the LD player to the digital input jack.
Please refer to the instruction manual of the adapter when making connection.

※2 Some DVD digital outputs have the function of switching the Dolby Digital signal output method between "bit stream" and "(convert to) PCM". When playing in Dolby Digital surround on the AVR-1604, switch the DVD player's output mode to "bit stream". In some cases players are equipped with both "bit stream + PCM" and "PCM only" digital outputs. In this case connect the "bit stream + PCM" jacks to the AVR-1604.

(2) Dolby Pro Logic II

- Dolby Pro-Logic II is a new multi-channel playback format developed by Dolby Laboratories using feedback logic steering technology and offering improvements over conventional Dolby Pro Logic circuits.
- Dolby Pro Logic II can be used to decode not only sources recorded in Dolby Surround (※) but also regular stereo sources into five channels (front left, front right, center, surround left and surround right) to achieve surround sound.
- Whereas with conventional Dolby Pro Logic the surround channel playback frequency band was limited, Dolby Pro Logic II offers a wider band range (20 Hz to 20 kHz or greater). In addition, the surround channels were monaural (the surround left and right channels were the same) with previous Dolby Pro Logic, but Dolby Pro Logic II they are played as stereo signals.
- Various parameters can be set according to the type of source and the contents, so it is possible to achieve optimum decoding (see page 27).

※ Sources recorded in Dolby Surround
These are sources in which three or more channels of surround have been recorded as two channels of signals using Dolby Surround encoding technology.
Dolby Surround is used for the sound tracks of movies recorded on DVDs, LDs and video cassettes to be played on stereo VCRs, as well as for the stereo broadcast signals of FM radio, TV, satellite broadcasts and cable TV.
Decoding these signals with Dolby Pro Logic II makes it possible to achieve multi-channel surround playback. The signals can also be played on ordinary stereo equipment, in which case they provide normal stereo sound.

There are two types of DVD Dolby surround recording signals.
① 2-channel PCM stereo signals
② 2-channel Dolby Digital signals

When either of these signals is input to the AVR-1604, the surround mode is automatically set to Dolby Pro Logic II when the "DOLBY/DTS SURROUND" mode is selected.

■ **Sources recorded in Dolby Surround are indicated with the logo mark shown below**

Dolby Surround support mark: DOLBY SURROUND

Manufactured under license from Dolby Laboratories.
"Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories.

DTS Digital Surround

Digital Theater Surround (also called simply DTS) is a multi-channel digital signal format developed by Digital Theater Systems.
DTS offers the same "5.1" playback channels as Dolby Digital (front left, front right and center, surround left and surround right) as well as the stereo 2-channel mode. The signals for the different channels are fully independent, eliminating the risk of deterioration of sound quality due to interference between signals, crosstalk, etc.
DTS features a relatively higher bit rate as compared to Dolby Digital (1234 kbps for CDs and LDs, 1536 kbps for DVDs) so it operates with a relatively low compression rate. Because of this the amount of data is great, and when DTS playback is used in movie theaters, a separate CD-ROM synchronized with the film is played.
With LDs and DVDs, there is of course no need for an extra disc; the pictures and sound can be recorded simultaneously on the same disc, so the discs can be handled in the same way as discs with other formats.
There are also music CDs recorded in DTS. These CDs include 5.1-channel surround signals (compared to two channels on current CDs). They do not include picture data, but they offer surround playback on CD players that are equipped with digital outputs (PCM type digital output required).
DTS surround track playback offers the same intricate, grand sound as in a movie theater, right in your own listening room.

■ **DTS compatible media and playback methods**

Marks indicating DTS compatibility: DIGITAL dts SURROUND and dts.

The following are general examples. Also refer to the player's operating instructions.

Media	Dolby Digital output jacks	Playback method (reference page)
CD	Optical or coaxial digital output (same as for PCM) ※2	Set the input mode to "AUTO" or "DTS" (page 18). Never set the mode to "ANALOG" or "PCM". ※1
LD (VDP)	Optical or coaxial digital output (same as for PCM) ※2	Set the input mode to "AUTO" or "DTS" (page 18). Never set the mode to "ANALOG" or "PCM". ※1
DVD	Optical or coaxial digital output (same as for PCM) ※3	Set the input mode to "AUTO" or "DTS" (page 18).

※1 DTS signals are recorded in the same way on CDs and LDs as PCM signals. Because of this, the un-decoded DTS signals are output as random "hissy" noise from the CD or LD player's analog outputs. If this noise is played with the amplifier set at a very high volume, it may possibly cause damage to the speakers. To avoid this, be sure to switch the input mode to "AUTO" or "DTS" before playing CDs or LDs recorded in DTS. Also, never switch the input mode to "ANALOG" or "PCM" during playback. The same holds true when playing CDs or LDs on a DVD player or LD/DVD compatible player. For DVDs, the DTS signals are recorded in a special way so this problem does not occur.

※2 The signals provided at the digital outputs of a CD or LD player may undergo some sort of internal signal processing (output level adjustment, sampling frequency conversion, etc.). In this case the DTS-encoded signals may be processed erroneously, in which case they cannot be decoded by the AVR-1604, or may only produce noise. Before playing DTS signals for the first time, turn down the master volume to a low level, start playing the DTS disc, then check whether the DTS indicator on the AVR-1604 (see page 29) lights before turning up the master volume.

※3 A DVD player with DTS-compatible digital output is required to play DTS DVDs. A DTS Digital Output logo is featured on the front panel of compatible DVD players. Recent DENON DVD player models feature DTS-compatible digital output – consult the player's owner's manual for information on configuring the digital output for DTS playback of DTS-encoded DVDs.

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DTS-ES Extended Surround™

DTS-ES Extended Surround is a new multi-channel digital signal format developed by Digital Theater Systems Inc. While offering high compatibility with the conventional DTS Digital Surround format, DTS-ES Extended Surround greatly improves the 360-degree surround impression and space expression thanks to further expanded surround signals. This format has been used professionally in movie theaters since 1999.
In addition to the 5.1 surround channels (FL, FR, C, SL, SR and LFE), DTS-ES Extended Surround also offers the SB (Surround Back, sometimes also referred to as "surround center") channel for surround playback with a total of 6.1 channels. DTS-ES Extended Surround includes two signal formats with different surround signal recording methods, as described below.

■ DTS-ES™ Discrete 6.1

DTS-ES Discrete 6.1 is the newest recording format. With it, all 6.1 channels (including the SB channel) are recorded independently using a digital discrete system. The main feature of this format is that because the SL, SR and SB channels are fully independent, the sound can be designed with total freedom and it is possible to achieve a sense that the acoustic images are moving about freely among the background sounds surrounding the listener from 360 degrees.
Though maximum performance is achieved when sound tracks recorded with this system are played using a DTS-ES decoder, when played with a conventional DTS decoder the SB channel signals are automatically down-mixed to the SL and SR channels, so none of the signal components are lost.

■ DTS-ES™ Matrix 6.1

With this format, the additional SB channel signals undergo matrix encoding and are input to the SL and SR channels beforehand. Upon playback they are decoded to the SL, SR and SB channels. The performance of the encoder used at the time of recording can be fully matched using a high precision digital matrix decoder developed by DTS, thereby achieving surround sound more faithful to the producer's sound design aims than with conventional 5.1- or 6.1-channel systems.
In addition, the bit stream format is 100% compatible with conventional DTS signals, so the effect of the Matrix 6.1 format can be achieved even with 5.1-channel signal sources. Of course it is also possible to play DTS-ES Matrix 6.1 encoded sources with a DTS 5.1-channel decoder.

When DTS-ES Discrete 6.1 or Matrix 6.1 encoded sources are decoded with a DTS-ES decoder, the format is automatically detected upon decoding and the optimum playing mode is selected. However, some Matrix 6.1 sources may be detected as having a 5.1-channel format, so the DTS-ES Matrix 6.1 mode must be set manually to play these sources.
(For instructions on selecting the surround mode, see page 29.)

The DTS-ES decoder includes another function, the DTS Neo:6 surround mode for 6.1-channel playback of digital PCM and analog signal sources.

■ DTS Neo:6™ surround

This mode applies conventional 2-channel signals to the high precision digital matrix decoder used for DTS-ES Matrix 6.1 to achieve 6.1-channel surround playback. High precision input signal detection and matrix processing enable full band reproduction (frequency response of 20 Hz to 20 kHz or greater) for all 6.1 channels, and separation between the different channels is improved to the same level as that of a digital discrete system.
DTS Neo:6 surround includes two modes for selecting the optimum decoding for the signal source.

- **DTS Neo:6 Cinema**
  This mode is optimum for playing movies. Decoding is performed with emphasis on separation performance to achieve the same atmosphere with 2-channel sources as with 6.1-channel sources.
  This mode is effective for playing sources recorded in conventional surround formats as well, because the in-phase component is assigned mainly to the center channel (C) and the reversed phase component to the surround (SL, SR and SB channels).
- **DTS Neo:6 Music**
  This mode is suited mainly for playing music. The front channel (FL and FR) signals bypass the decoder and are played directly so there is no loss of sound quality, and the effect of the surround signals output from the center (C) and surround (SL, SR and SB) channels add a natural sense of expansion to the sound field.

19 TROUBLESHOOTING

If a problem should arise,first check the following.
1. Are the connections correct ?
2. Have you operated the receiver according to the Operating Instructions ?
3. Are the speakers and other components operating property ?

If this unit is not operating properly, check the items listed in the table below. Should the problem persist, there may be a malfunction.
Disconnect the power immediately and contact your store of purchase.

	Symptom	Cause	Measures	Page
Common problems arising when listening to the CD, records, tapes, and FM broadcasts, etc.	DISPLAY not lit and sound not produced when power operation switch set to on.	• Power supply cord not plugged in securely.	• Check the insertion of the power supply cord plug. • Turn the power off with the remote control unit after turning the POWER operation switch on.	6 17
	DISPLAY lit but sound not produced.	• Speaker cords not securely connected. • Improper position of the audio function button. • Volume control set to minimum. • MUTING is on. • Digital signals not input Digital input selected.	• Connect securely. • Set to a suitable position. • Turn volume up to suitable level. • Switch off MUTING. • Input digital signals or select input jacks to which digital signals are being input.	8, 9 18 18 19 18
	DISPLAY not displayed and the power indicator flashes at a high rate.	• Speaker terminals are short-circuited. • Block the ventilation holes of the set. • The unit is operating at continuous high power conditions and/or inadequate ventilation.	• Switch power off, connect speakers properly, then switch power back on. • Turn off the set's power, then ventilate it well to cool it down. Once the set is cooled down, turn the power back on. • Turn off the set's power, then ventilate it well to cool it down. Once the set is cooled down, turn the power back on.	8, 9 3, 9 3, 9
	Sound produced only from one channel.	• Incomplete connection of speaker cords. • Incomplete connection of input/output cords.	• Connect securely. • Connect securely.	8, 9 6 ~ 9
	Positions of instruments reversed during stereo playback.	• Reverse connections of left and right speakers or left and right input/output cords.	• Check left and right connections.	8, 9
Remote control unit	This unit does not operate properly when remote control unit is used.	• Batteries dead. • Remote control unit too far from this unit. • Obstacle between this unit and remote control unit. • Different button is being pressed. • ⊕ and ⊖ ends of battery inserted in reverse.	• Replace with new batteries. • Move closer. • Remove obstacle. • Press the proper button. • Insert batteries properly.	9 9 9 — 9

20 SPECIFICATIONS

■ Audio section

• Power amplifier

Rated output:	Front:	75 W + 75 W	(8 Ω/ohms, 20 Hz ~ 20 kHz with 0.08% T.H.D.)
		110 W + 110 W	(6 Ω/ohms, 1 kHz with 0.7% T.H.D.)
	Center:	75 W	(8 Ω/ohms, 20 Hz ~ 20 kHz with 0.08% T.H.D.)
		110 W	(6 Ω/ohms, 1 kHz with 0.7% T.H.D.)
	Surround:	75 W + 75 W	(8 Ω/ohms, 20 Hz ~ 20 kHz with 0.08% T.H.D.)
		110 W + 110 W	(6 Ω/ohms, 1 kHz with 0.7% T.H.D.)
	Surround Back:	75 W	(8 Ω/ohms, 20 Hz ~ 20 kHz with 0.08% T.H.D.)
		110 W	(6 Ω/ohms, 1 kHz with 0.7% T.H.D.)
Output terminals:	Front:	A or B	6 ~ 16 Ω/ohms
		A + B	12 ~ 16 Ω/ohms
	Center/Surround/Surr. Back:		6 ~ 16 Ω/ohms

• Analog

Input sensitivity / input impedance:	200 mV / 47 kΩ/kohms
Frequency response:	10 Hz ~ 100 kHz: +1, –3 dB (TONE DEFEAT ON)
S/N ratio:	98 dB (IHF-A weighted) (TONE DEFEAT ON)

■ Video section

• Standard video jacks

Input / output level and impedance:	1 Vp-p, 75 Ω/ohms
Frequency response:	5 Hz ~ 10 MHz — +1, –3 dB

• S-video jacks

Input / output level and impedance:	Y (brightness) signal — 1 Vp-p, 75 Ω/ohms
	C (color) signal — 0.286 Vp-p, 75 Ω/ohms
Frequency response:	5 Hz ~ 10 MHz — +1, –3 dB

■ Tuner section

	[FM] (note: µV at 75 Ω/ohms, 0 dBf=1 x 10^{-15} W)		**[AM]**
Receiving Range:	87.50 MHz ~ 108.00 MHz		522 kHz ~ 1611 kHz
Usable Sensitivity:	1.0 µV (11.2 dBf)		18 µV
50 dB Quieting Sensitivity:	MONO	1.6 µV (15.3 dBf)	
	STEREO	23 µV (38.5 dBf)	
S/N ratio:	MONO	80 dB (IHF-A weighted)	
	STEREO	75 dB (IHF-A weighted)	
Total Harmonic Distortion:	MONO	0.15 % (1 kHz)	
	STEREO	0.3 % (1 kHz)	

■ General

Power supply:	AC 230 V, 50 Hz
Power consumption:	220 W
	1 W Max (Standby)
Maximum external dimensions:	434 (W) x 147 (H) x 417 (D) mm
Mass:	10.8 kg

■ Remote control unit (RC-941)

Batteries:	R6P/AA Type (two batteries)
External dimensions:	55 (W) x 225 (H) x 34.5 (D) mm
Mass:	165 g (including batteries)

* For purposes of improvement, specifications and design are subject to change without notice.